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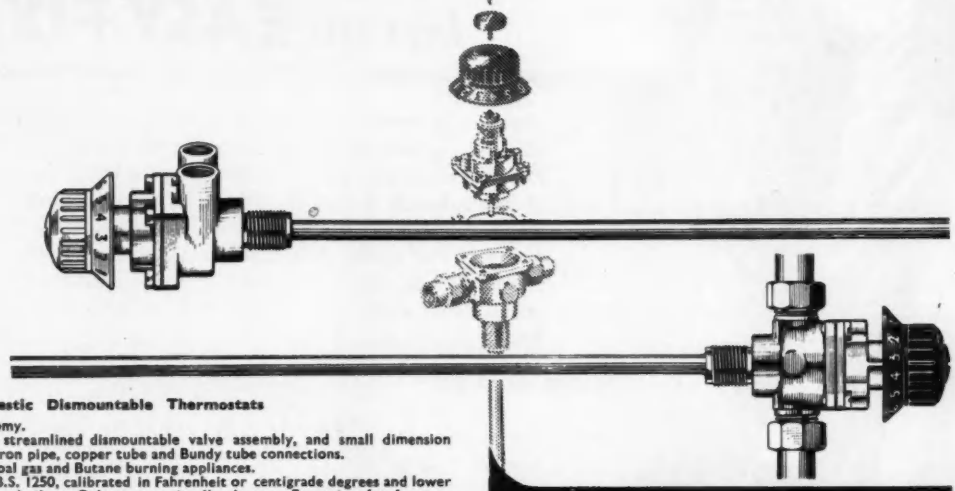

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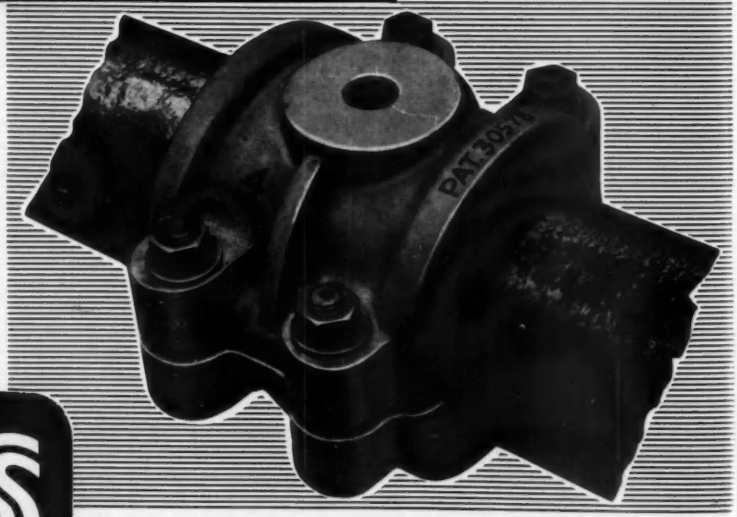

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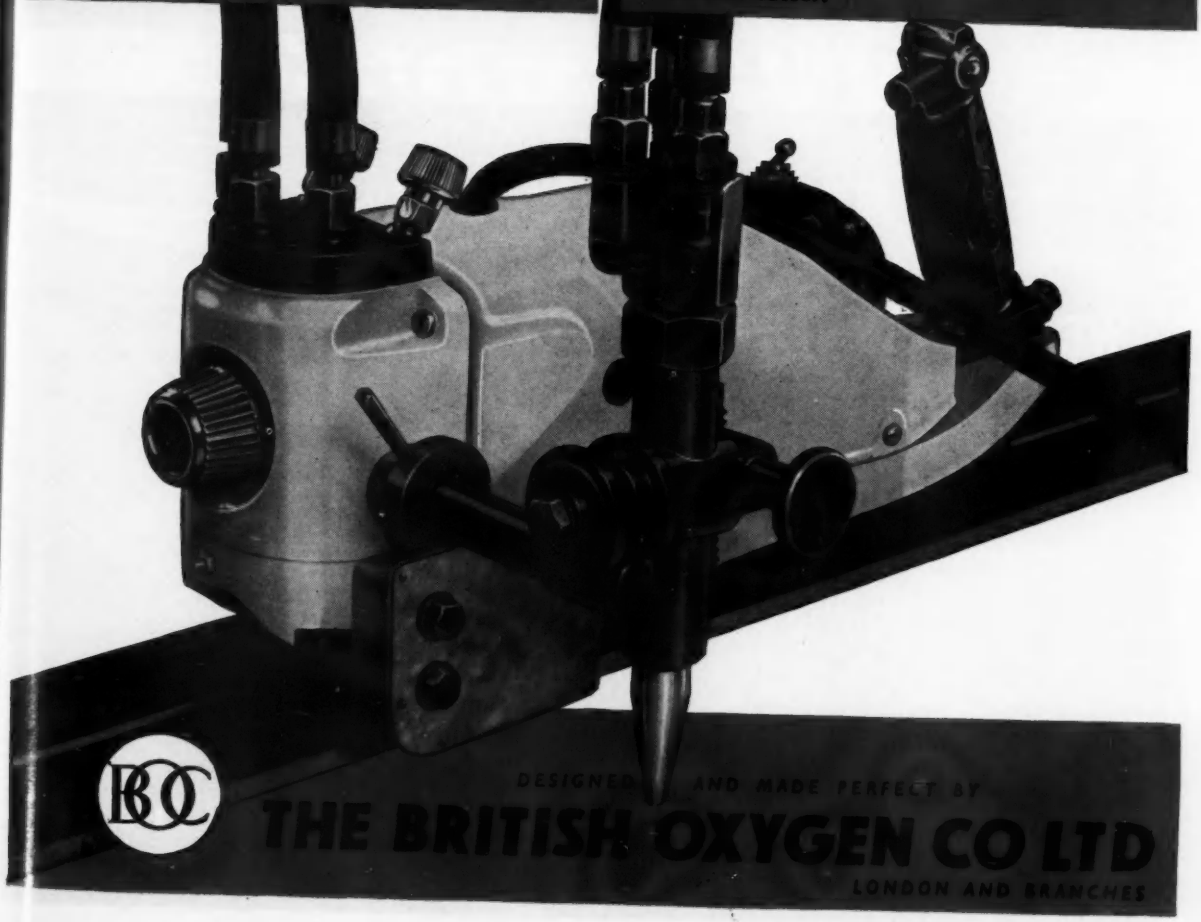

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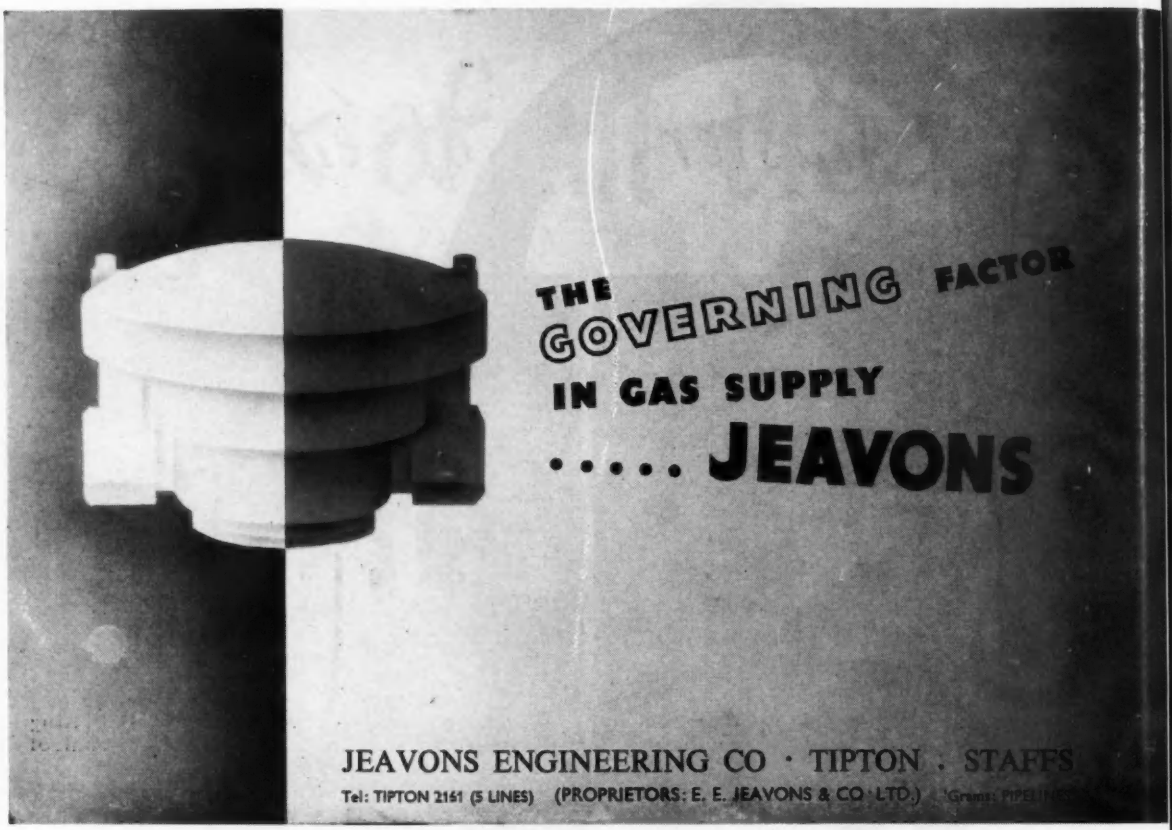
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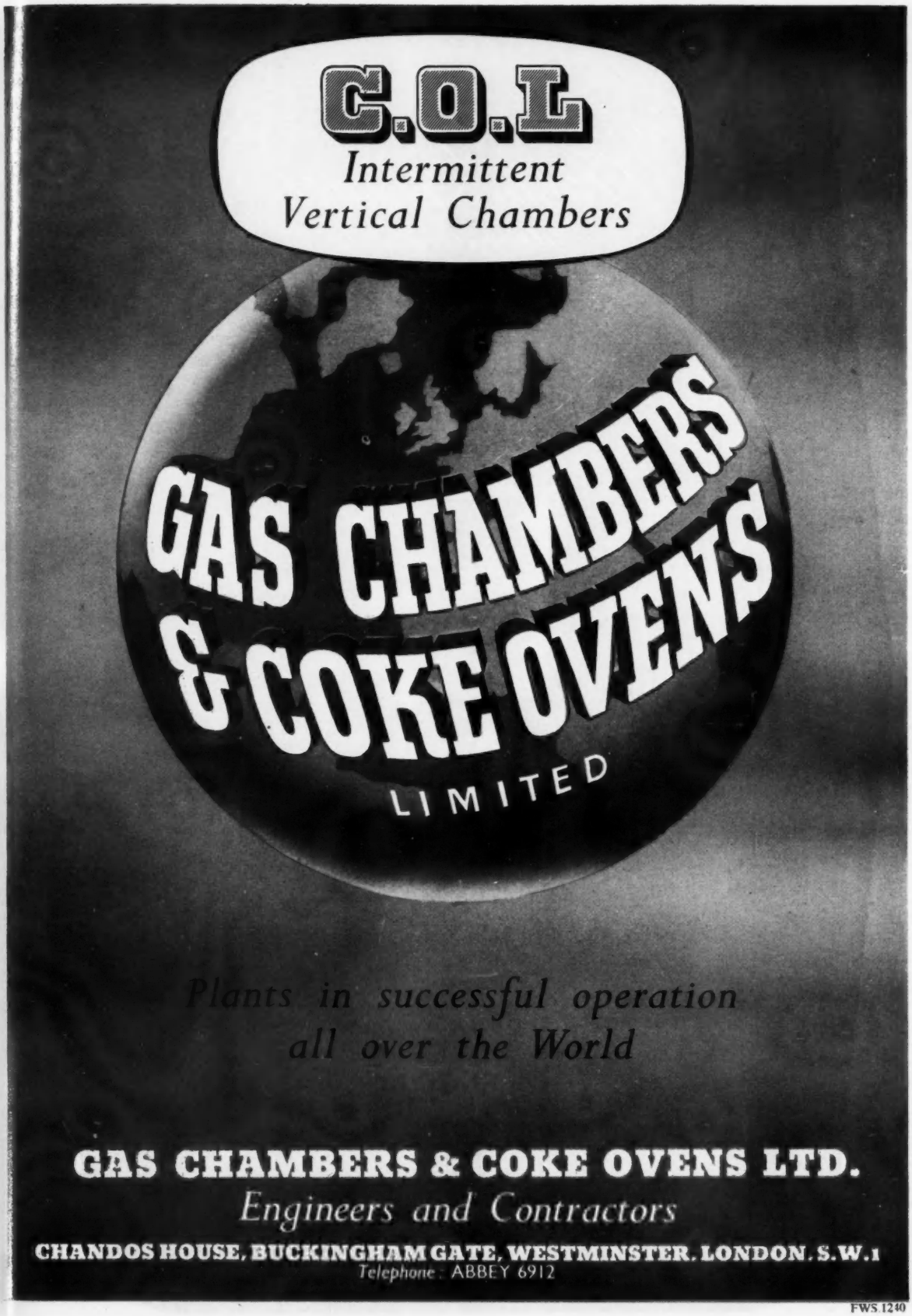
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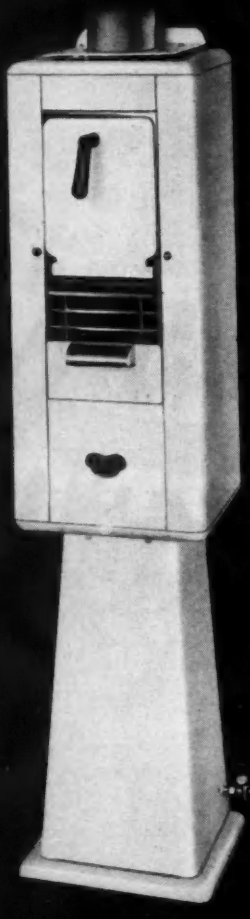

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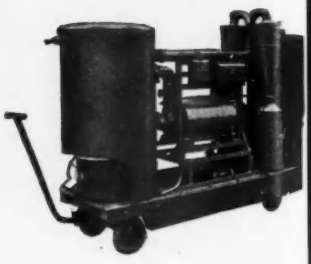

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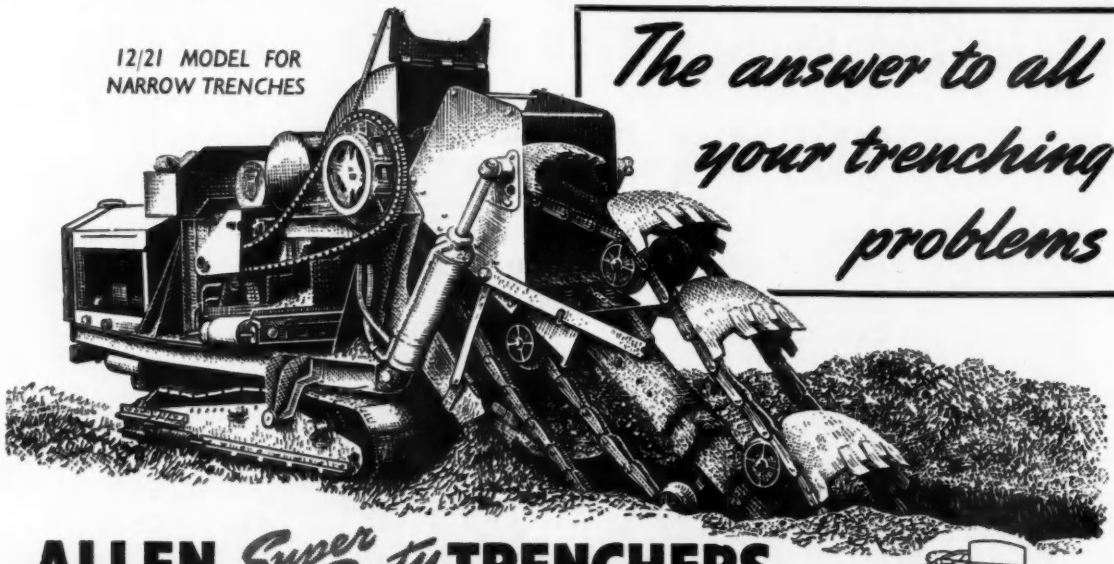

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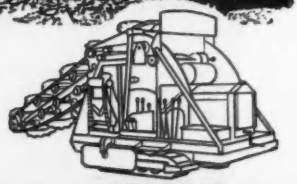

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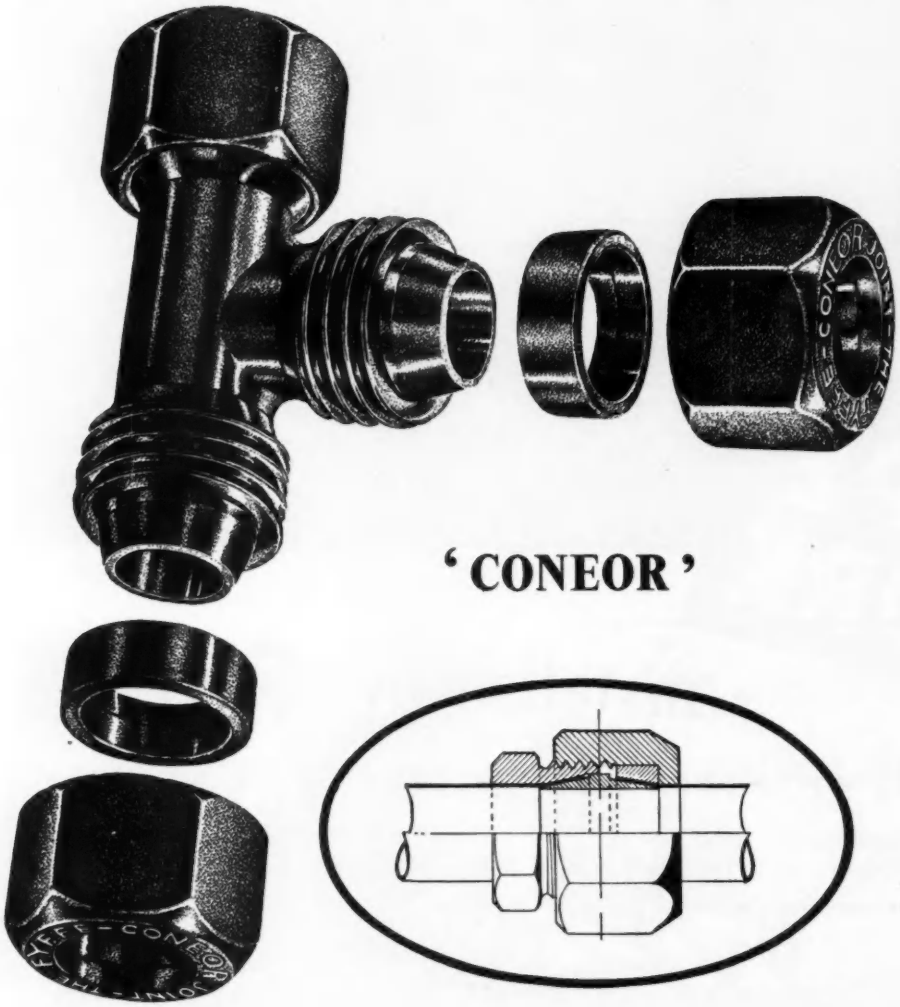

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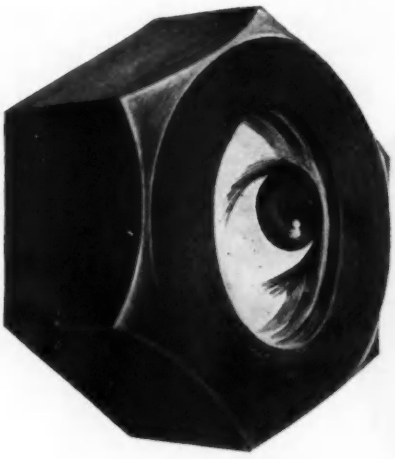

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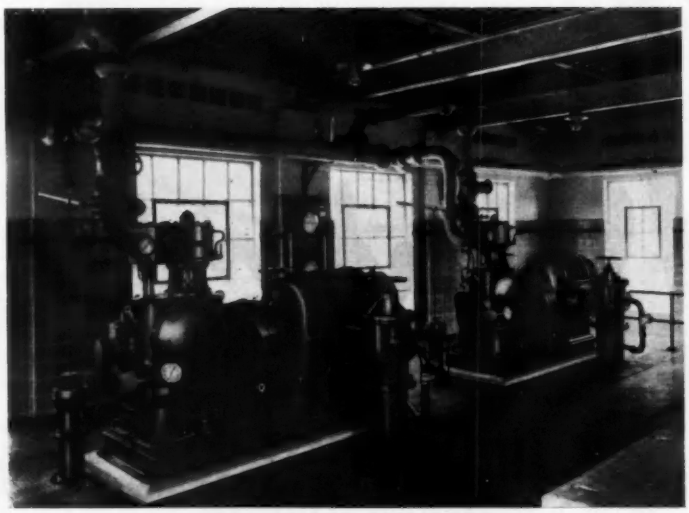

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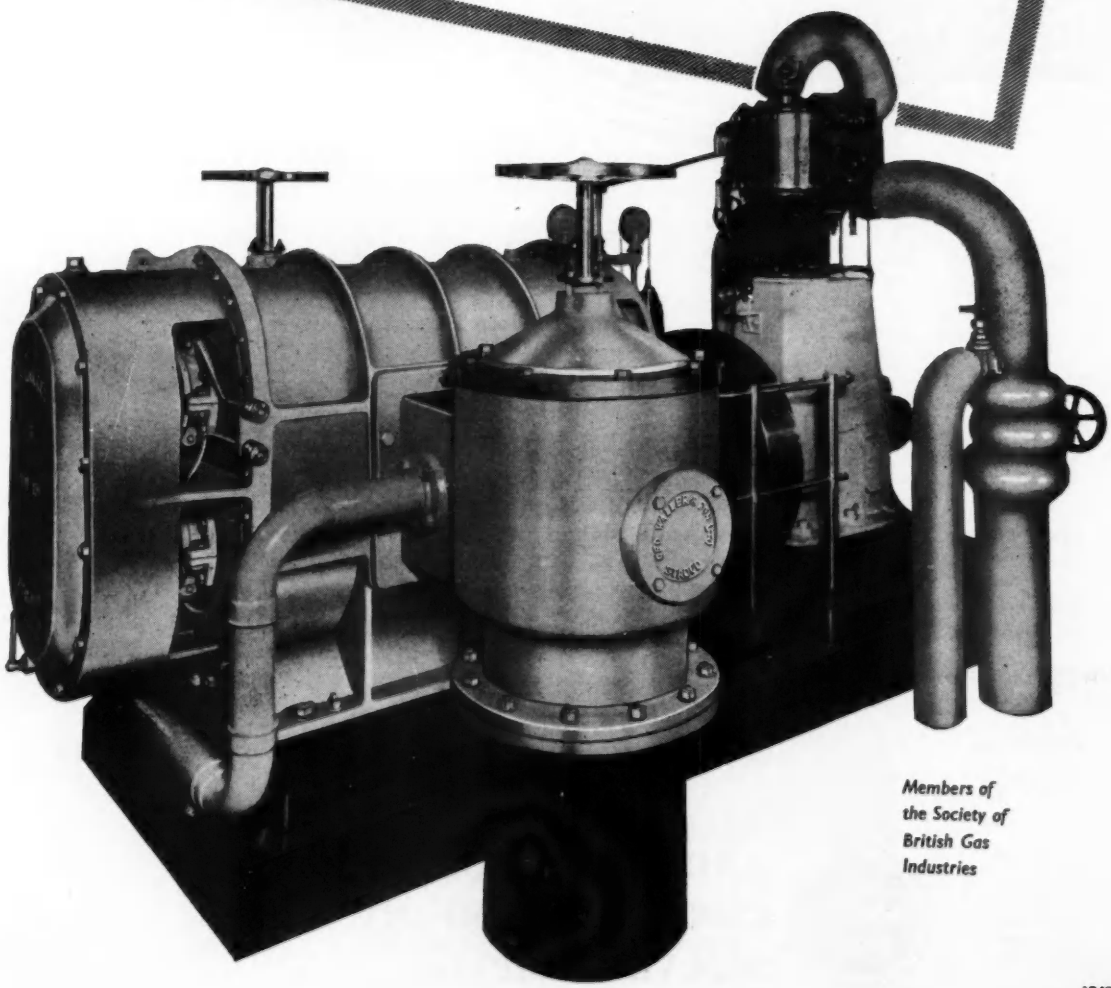

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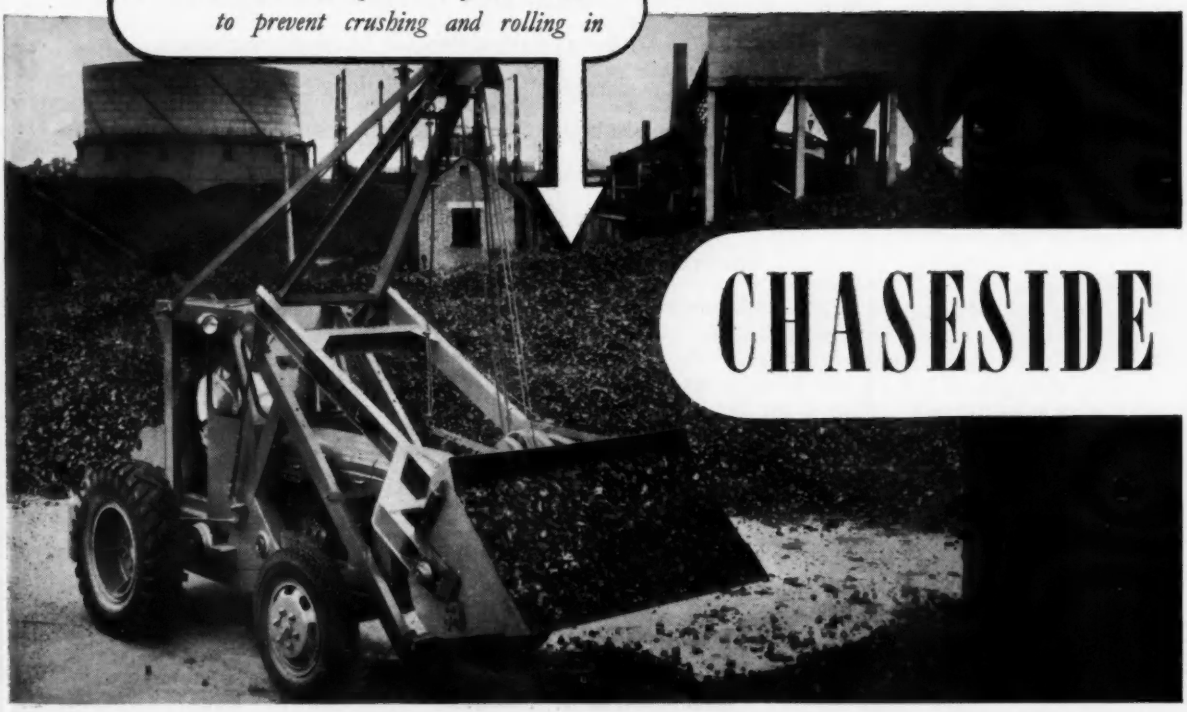

TAS/CD 399

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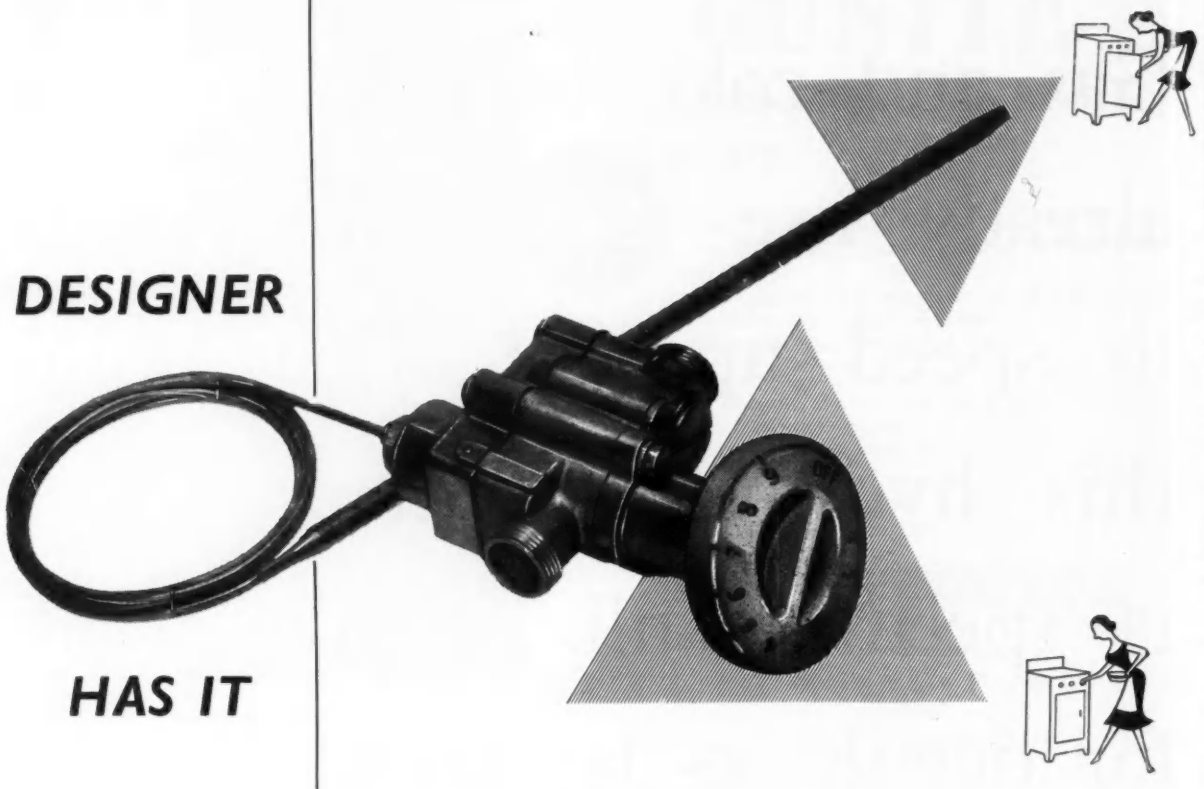

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Uses increasing for New-type Mesh Metal

ADAPTABLE & ECONOMICAL

NEW uses for expanded metal are being discovered daily. The following are only a few of its many applications:— Safety guards for all kinds of machinery, radiators, trees, windows, ventilators, fires, etc. Racks and shelves, industrial trays and baskets, storage bins; air filters; backing for insulating materials; poultry cages; pallets and stillages; balcony balustrading; litter baskets; partitions and enclosures. Indeed, hundreds of widely different types of articles are now better and more easily made with Expanded Metal, now available in two new forms: Flattened "Expamet" and Safe-mesh "Expamet".

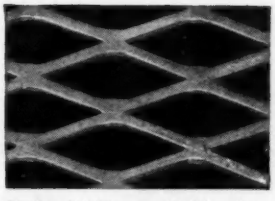
Machinery Guards *Machinery guards are one of the many uses for Safe-mesh "Expamet". These were made by the City Sheet Metal Works, Ltd., Leicester.*

What is Expanded Metal?

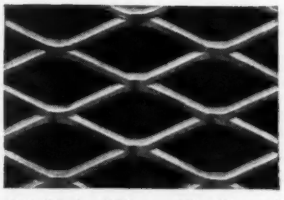
Expanded metal is made from a solid sheet of rolled sheet metal — steel, stainless steel, aluminium, brass or copper. It is cut and expanded without any waste of material into a network of diamond shaped meshes. The finished meshwork is strong and durable; it is easy to work, weld and shape; it has a naturally decorative appearance and is suitable for most of the available finishing processes.

Two New Types

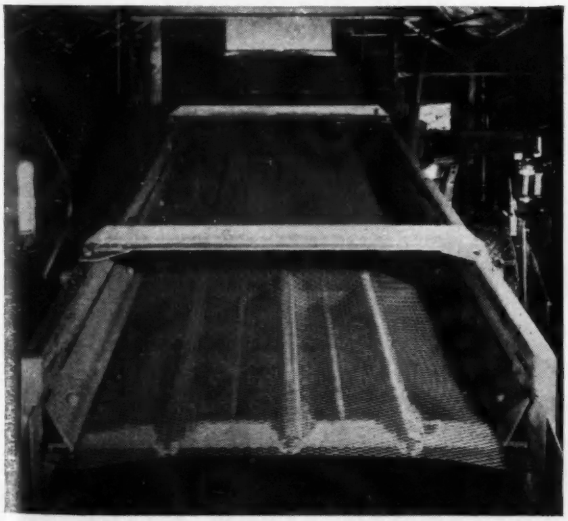
The two new basic ranges of expanded metal which are now on the market are — Flattened and Safe-mesh "Expamet". The first, Flattened "Expamet", is made by brushing and pressure-rolling the strands and junctions of Expanded Metal, so as to obtain a flat, smooth and level surface. The other, Safe-mesh "Expamet", is a range of meshes which have been brushed to remove all burrs and rough edges.



Flattened "Expamet" *The above illustration shows an example of Flattened "Expamet". This is made in thirteen different weights and mesh sizes from 5/32" to 1¼" (shortway of mesh).*



Safe-Mesh "Expamet" *Pictured above is Safe-Mesh "Expamet" which is produced in eight standard weights, and in mesh sizes from ¼" to 1½" (shortway of mesh).*



Flattened "Expamet" *used as a screen in a Vibrator screen Grading.*

Can it Help You?

Adaptable, economical and long lasting — there are an infinite number of uses for Expanded Metal. Wherever there is a gap to be filled or an article to be made with open meshwork, industry is using this very versatile material; and imaginative executives are finding new and unsuspected uses for it daily. For full information and advice, please write or telephone.

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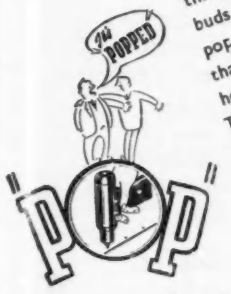

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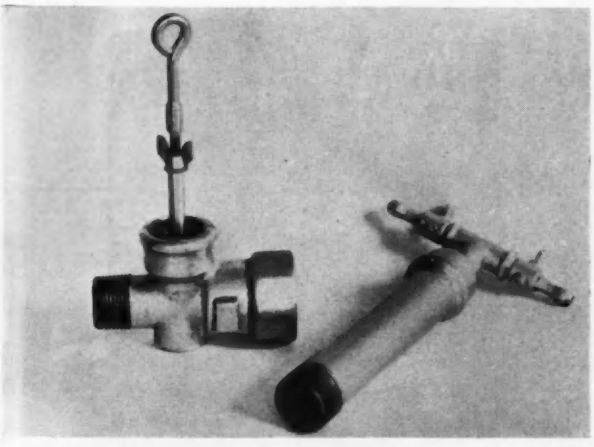

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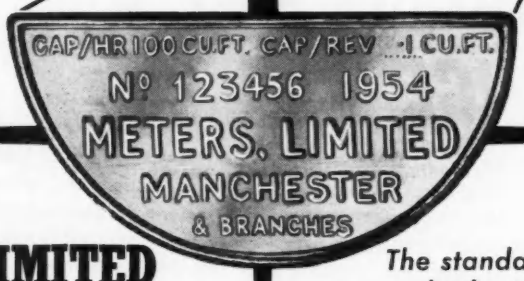

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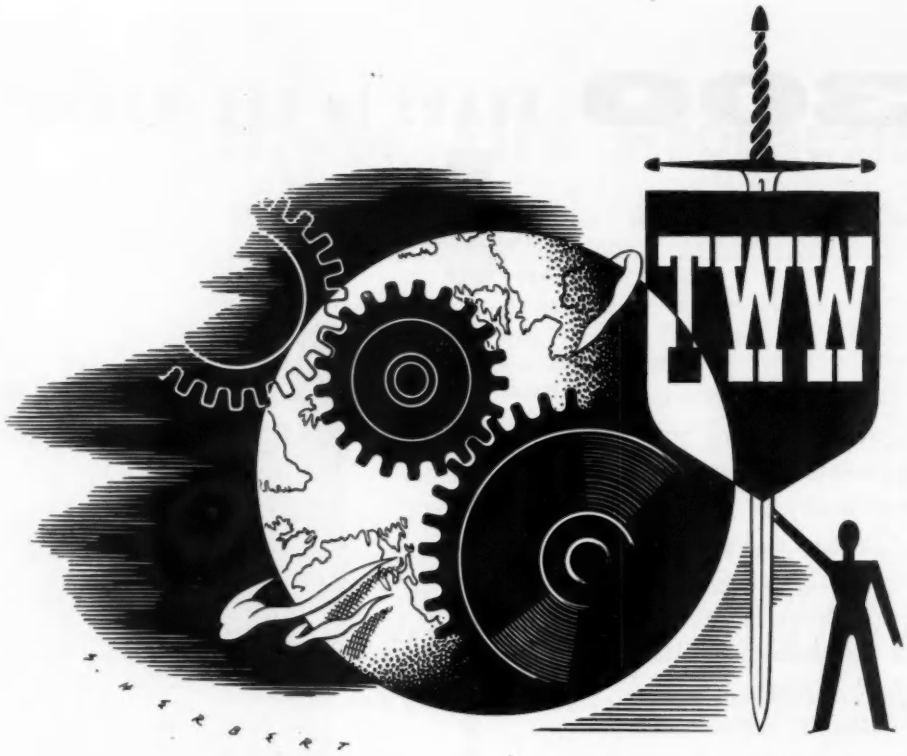

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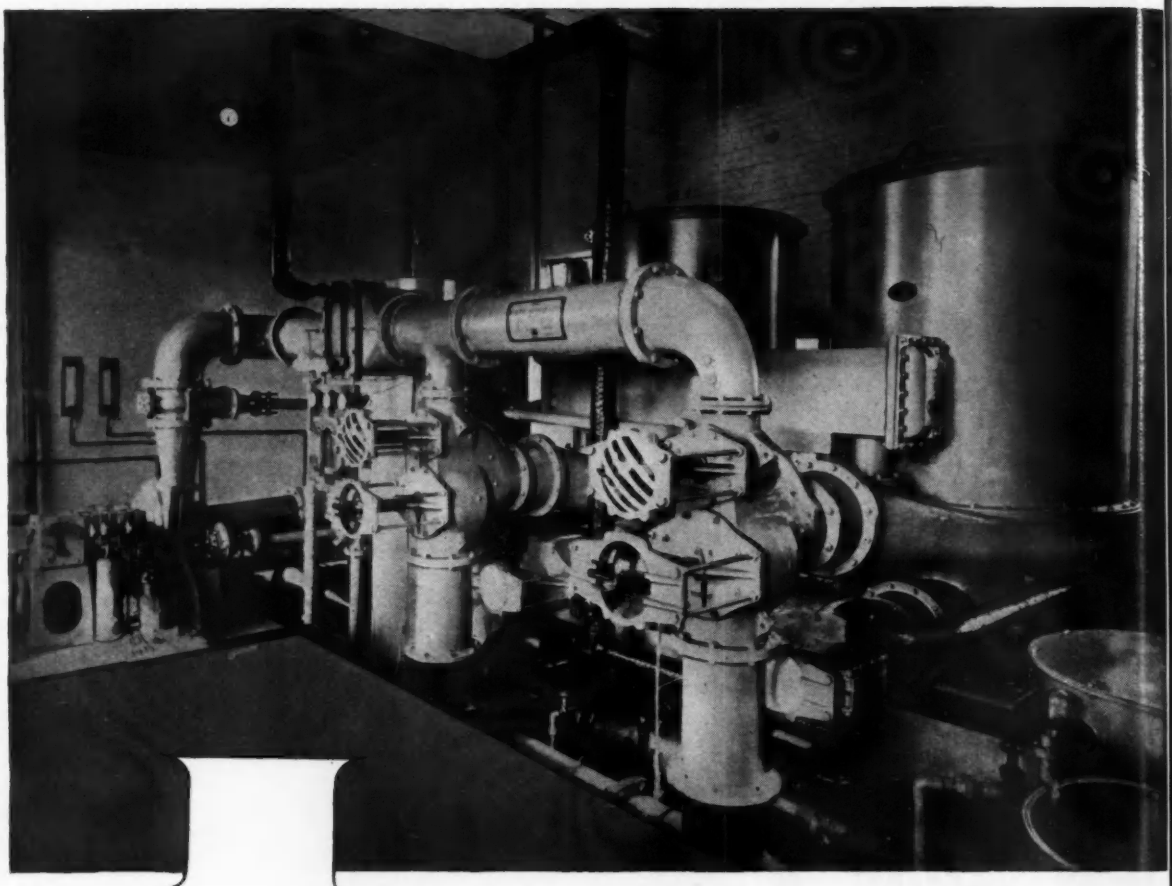

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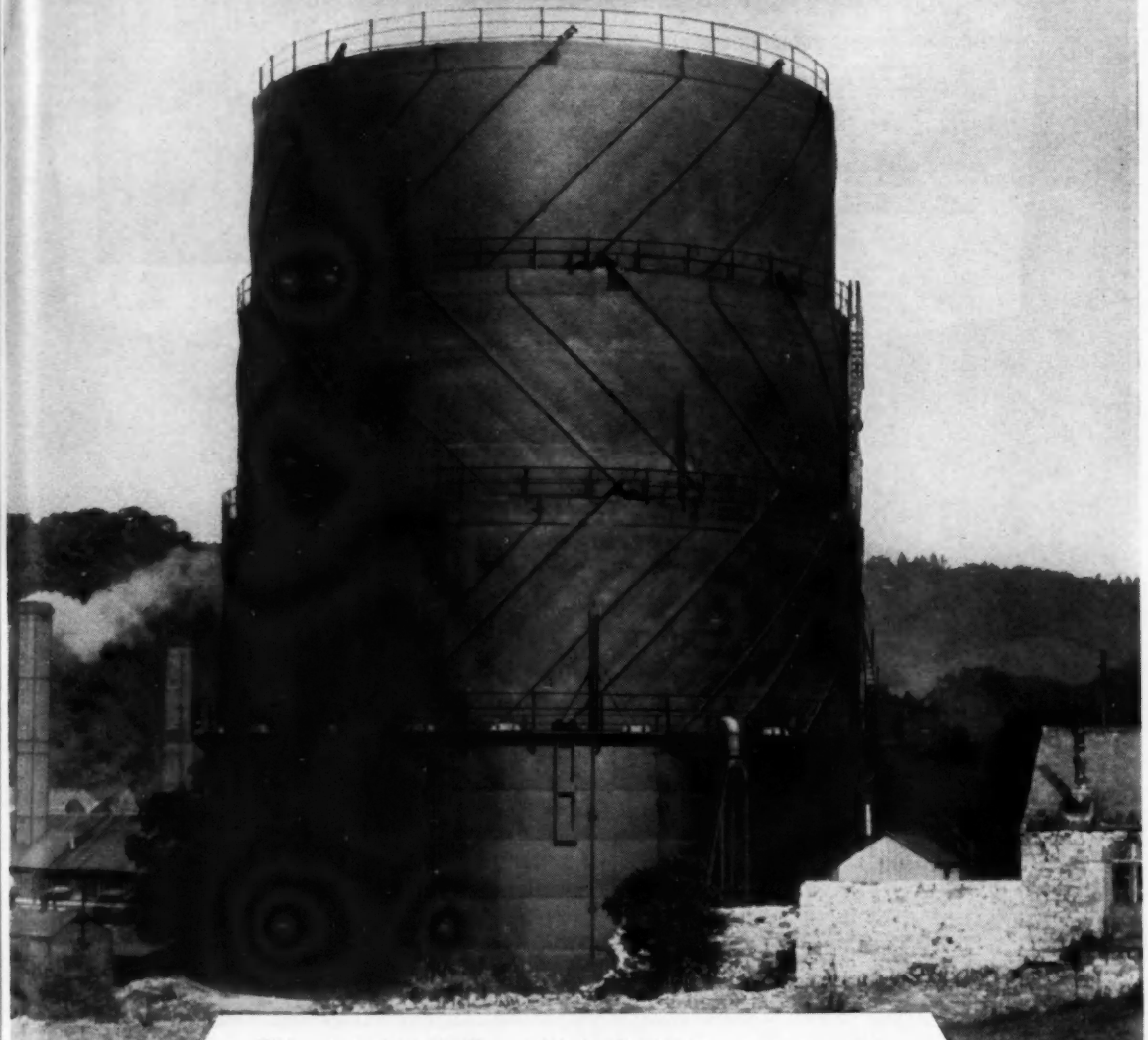

This all electrically welded Gasholder was recently completed for the East Midlands Gas Board at Bakewell, Derbyshire. It is a three lift spiral guided type in a steel tank. Capacity 250,000 cu. ft. Steel Tank 73′ 0″ dia x 26′ 6″ deep.

Photograph by Courtesy of East Midlands Gas Board

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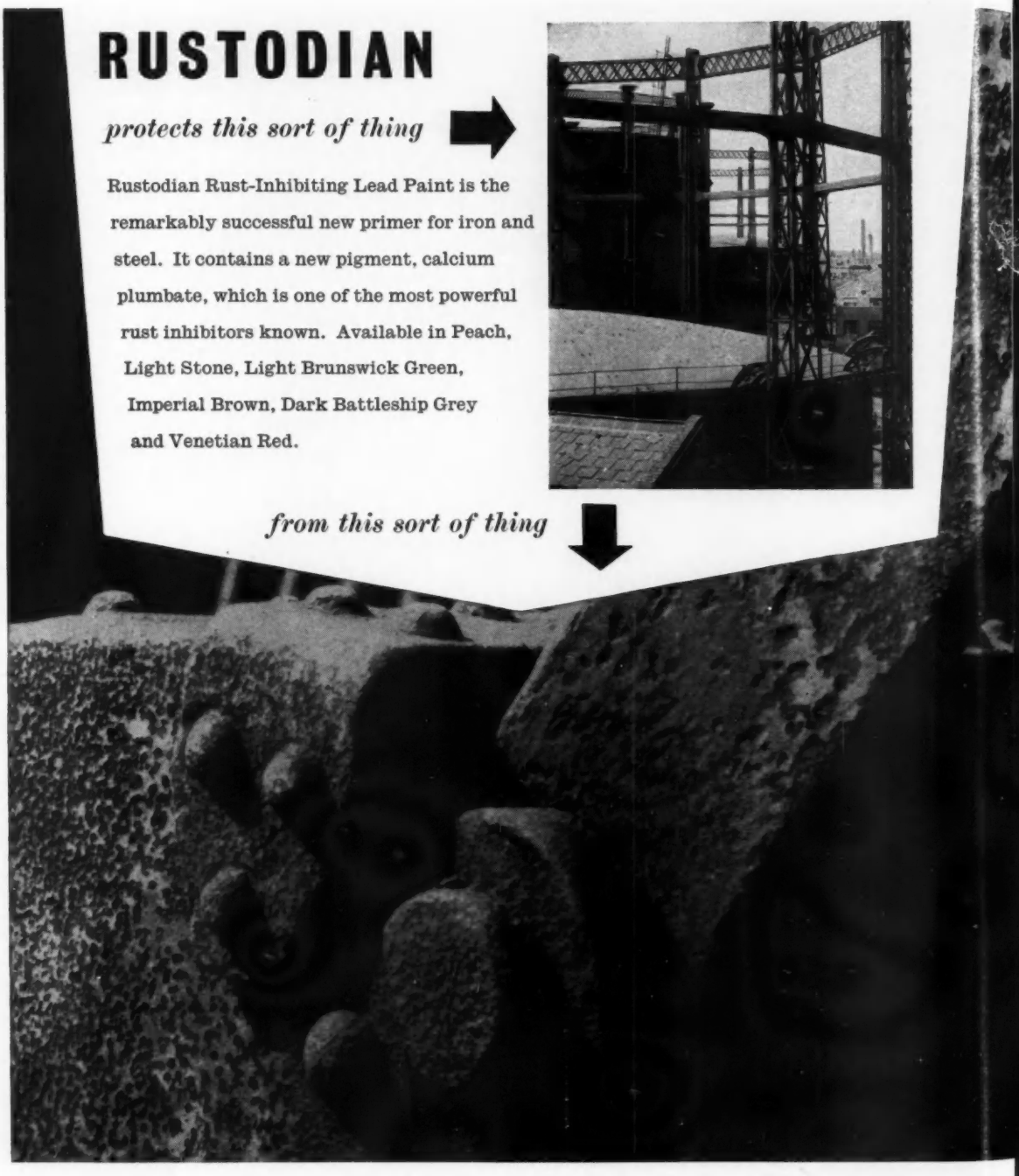

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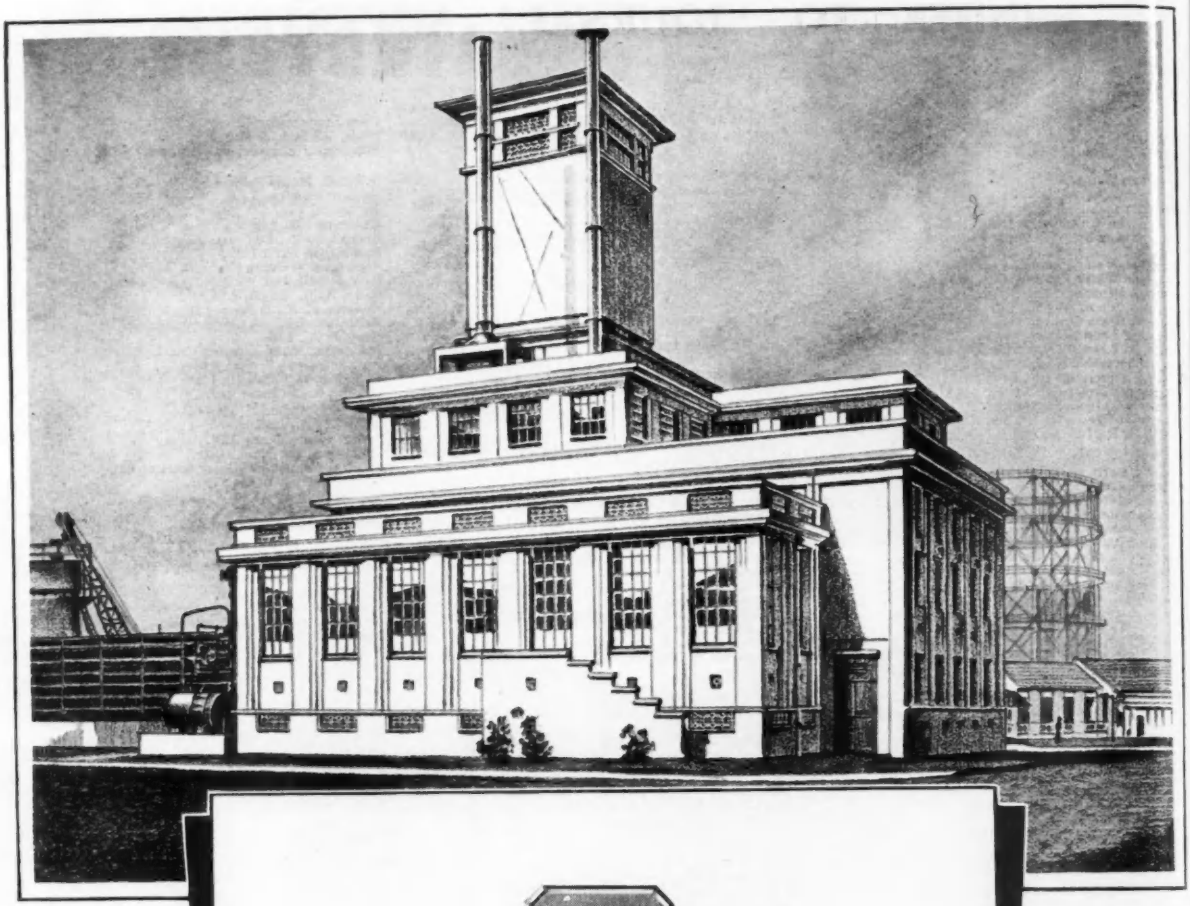

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106th YEAR OF PUBLICATION

EDITOR: CLIFFORD A. KING
Deputy Editor: Arthur C. Cross
Technical Editor: Norman S. Smith, B.Sc., Assoc.M.Inst.Gas E.

11, BOLT COURT, FLEET ST., Telephone: CENtral 2236-7
LONDON, E.C.4. Telegrams: Gasking, Fleet.

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Subscription Rates: Home and Empire 52/–; Foreign 60/–
Full Publishers' Notice: See Page 457.
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IT is strange how much thought and praise is given to true craftsmanship and how little to the craftsmen who carry it out. For instance, thatched cottages and ricks have long been part of traditional England, yet the thatcher whose skill has been passed down from father to son, through many generations, goes his way unrecognised and unpraised, except by the 'expert few' who know.

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Gas Journal

VOL. 278. No. 4746 106TH YEAR May 19, 1954

ENERGY IN THE FUTURE

The salient point in Dr. Bronowski's recent impressive address to the North Western Section of the Institute of Fuel in Manchester was that atomic energy is not likely to do more in Great Britain during the next 10 to 20 years than to fill the gap between our increased energy requirements and that which we can derive from our indigenous coal resources. The world's use of energy is outstripping its mineral reserves (*i.e.*, of coal and oil). He addressed himself to the questions, 'Can atomic energy fill the gap? Will atomic energy mean an even greater congestion and centralisation of industries? If atomic energy takes over will coal-mining survive?' To the first and third he gave a qualified positive answer, to the second an interesting speculation.

The rate at which energy is being used all over the world has gone up enormously and continues to rise. In this country the consumption of electricity is doubling every 10 years. The consumption of oil is increasing as rapidly, perhaps more so in the U.S.A. Much the same is true in Russia and Eastern Europe. High use of energy *per capita* is a measure of the standard of life. The U.S.A. uses 10 tons of coal per head of population, Great Britain 5 tons, the East a mere fraction of a ton; the world average is less than ½ ton, a 20 to 1 ratio between the highest and the average. Calorie consumption is of the same order. Expectation of life in the U.S.A. and Britain is of the order of 70 to 75 years, while in India and China it is as low as 35. Indeed this great disparity is a major cause of world tension.

What are we to do about it? How much of the energy produced in the high consumption countries is running to waste? The energy resources upon which we are drawing at such a high rate are not replaceable. We have coal reserves for some low multiple of 100 years, oil for a few decades. There may be no cause for alarm before 2000 A.D. but then we may begin to be terribly short of petrol and driven back to coal as our own sole source of energy unless some substitute is developed. There are three alternatives offered to us. We can give up the use of energy—which is out of the question—we can make enormously better use of what we have; make a vast improvement in our efficiency of generation and use; we can discover and develop new sources of energy.

The second and third alternatives must run together. The use of fuel in the highly developed countries is still frightfully wasteful. Possibly the most abundant reserve of energy possessed by Great Britain is the energy she wastes. A basic economy must be realised of 10 mill. tons of coal per annum; a 5% saving should not be unattainable. But this will not cover the gap which is opening out before us. If we are to stay in the industrial race we shall have to place more mechanical power at the disposal of our industry. The average use of energy *per capita* in the U.S.A. is twice that in this country while in industry it is three times as much per employed person. Productivity in the U.S.A. is two to three times greater than that in this country, and this is not because the American works longer hours but because he uses more machinery with more power to run it. Output per man is directly proportional to the amount of energy employed. Standard of life is in the same proportion.

During the next 10 to 20 years we shall have to find most of the increased energy required from atomic fission. Some 30 mill. tons of coal or its equivalent must be found. There is a limit to what can be mined per annum and we have nearly reached it. If 10 mill. tons can be found by increased efficiencies, there is 20 mill. tons, perhaps 30 mill., to come from atomic fission. Atomic power stations require enormous capital expenditure for their development, but for this country their development is a matter of life and death, perhaps the emphasis is on 'death' elsewhere but for us the accent is on 'life' and on our economic survival.

Where do we stand today? The atomic power station at Calder Hall has a capacity of 40 MW—a mere experiment. Sir John Cockcroft has estimated that a 50 MW station would cost £450,000 per annum for fuel and capital but this would save £750,000 in coal per annum. The development of the breeder reactor is more promising. Some 1,000 tons of uranium is equivalent in energy output to 1 mill. tons of coal, but with the breeder this figure might come down to 10 to 100 tons. The gap of 20 mill. tons of coal per year might be met by 20 to 100 tons of uranium.

Dr. Bronowski does not think that the admittedly enormous difficulties are insurmountable. In the brief discussion—this was rather a matter of question and answer—he admitted that the disposal of 'effluent' (radioactive waste products) presents a formidable problem, a problem which will assume very large proportions indeed when we come to power stations of the 1,000 MW order. Uranium has the disadvantage of being an

imported fuel, but it is not particularly scarce. Canada and Australia possess very large deposits while the gold-mine waste heaps of South Africa are proving a prolific source. Finally, can we wait for atomic energy? To this Dr. Bronowski gave an answer of qualified optimism; but certainly very great effort will have to be put into the race against growing scarcities of other fuels.

He then turned to his closing speculation. Atomic stations must be very big. Present proposals are limited to generating electricity through the steam cycle with an efficiency of the order of 30%. Can we generate electricity direct, without going through the steam stage? Here he has great hopes of the 'chemical' cell. Batteries of reactive strontium, itself a major fraction of the effluent from the atomic pile, produce electricity direct, stepped down in voltage by a silicon transister, at the rate of 3 watts per gramme. In 50 years time there may be sources of energy without the losses of the steam cycle. And this brought him to his final speculation. In the long run the direct generation of electricity in some such cells may alter the pattern of civilisation. The advantage of generating in large units will disappear. Small units may drive us into a village economy. 'The big industrial town is on the way out.' A battery small enough to be buried in the back garden could furnish all the energy requirements of the household. Every factory may one day possess its own generating station.

MECHANISATION AND PRODUCTIVITY

When the Gas Industry Productivity Team which, under the leadership of Mr. J. H. Dyde, visited the United States in 1952, presented its report last year it underlined the importance of mechanisation as an aid to efficiency and productivity—a subject to which industry in general has since directed much thought and attention. While in terms of productivity the team found no evidence that American gasworkers as a whole were actually working harder than their British counterparts, it observed that it was the view of the American industry that increased productivity, where it had occurred, was due to improved techniques rather than to increased effort. A few examples in several fields of activity illustrated what was meant by improved techniques—mechanical aids to accelerate main and service laying operations; mechanical devices for handling and storing appliances; two-way radio equipment for dealing with emergency calls; and extended use of machine billing and accounting. Our own records of the many discussions to which the report gave rise show that there was no more interesting feature than the many references to mechanisation. In some respects it had to be admitted that we were behind our American friends in the application of labour-saving methods, partly because the machines were not obtainable. In general, however, the report served to indicate the long way we had already gone towards modernising our operations and the widespread use already being made of machinery on the works, on the district, and in the office.

It was altogether fitting that the recent fifth annual staff conference of the East Midlands Gas Board at Skegness—the first since the issue of the productivity report—should devote one-half of its programme to a symposium of five papers dealing with mechanisation in various sections of the Board's organisation. Clearly the main advantages to be derived from a greater degree of mechanisation in such an organisation lie in the fields of repetitive operations and in the elimination of bottlenecks in the smooth flow of work. Regarding the latter it is often the case that a happy combination of men and machines not only increases overall output but makes working conditions smoother and more enjoyable for the people concerned, while at the same time rendering an existing labour force more effective.

At the Skegness conference, we first heard the ideas of Mr. H. Firth, Mains Engineer of the Sheffield and Rotherham Division, concerning mechanisation in regard to mains and service laying. He spoke of many advantages of mechanisation. Also, he gave warning of two things to be avoided: First, the slowing of rate of progress due to plant shortage or failure; secondly, the overhead costs of expensive plant, and particularly of hired equipment where the hire charge generally involves a payment for standing time at a rate exceeding the interest and depreciation charges. There followed a joint paper by Mr. D. F. Rudge and Mr. C. E. Mills on mechanisation on the works, the lessons of which were reinforced by a film produced by the Board's own staff—a very good film, but, alas, spoiled in presentation by inadequate light. Almost as a natural sequence came a paper dealing with photo-printing as an aid to increased efficiency. This was presented by Mr. T. W. Fletcher, chief draughtsman of the Leicester and Northants Division. It was valuable not only in its own right but because it gave rise to a discussion which revealed how improvisation had led to successful work at reasonable cost.

Mr. C. H. Plumtree's paper on mechanisation applied to administration and accountancy evoked outspoken comment on dictating machines and other forms of office machines. The author declared that shorthand, once the key to all office promotions, is outmoded. Here we would interpolate that the annual staff conference is still reported by that outmoded method. Some day an up-to-date recording machine will take the place of the shorthand notebook and, maybe, of the man who knows how to use a shorthand pencil effectively. Whatever the result of this speculation, the author did in fact give a fascinating catalogue of the machines already used and of those available for promoting office efficiency. He did, however, ask plaintively whether we are making sufficient progress in their application in this country. He recently received a new 'Year Book' which contained an article on office machinery. He discovered that the article was identical with one that appeared in the same 'Year Book' several years ago. Having had experience in the revision of an annual compendium of value, we suggest that the answer lies in better co-operation between publisher and editor and those who are in a position to supply current statistics. Today a big gap undoubtedly exists. Finally we had a paper from Mr. E. A. Senior, Administrative Assistant to the Commercial Manager, on mechanisation associated with consumer service, in many ways reminiscent of the efforts which the gas industry productivity team saw in the United States. We believe that we are not far behind America in this sphere. Some of the items mentioned by Mr. Senior have not yet gone beyond the suggestion stage, but the enthusiasm is there. To survive, we must be efficient. To prosper, we must so

direct our efforts as to convince the public that the gas industry is at least as vigorous, at least as progressive, and at least as imaginatively conducted as any other industry. It is a point of more than passing interest that (as far as can be superficially ascertained) 'those nations which employ mechanised methods to the largest degree are those which enjoy the highest standard of living.' We quote from the paper by Mr. Senior, but we do not know how to interpret the phrase: 'The highest standard of living'. The arts in their many illuminating phases, and science and literature, wit and originality, cannot, to our mind, depend so largely on mechanical horse-power as majority opinion today would have us believe.

PORTHCAWL MEETING

The Wales and Monmouthshire Section of the Institution of Gas Engineers returned to Porthcawl for its spring meeting last week after a longer interval than usual—an interval prolonged by the fact that in recent years a number of North Wales resorts have been included in the Section's itinerary. If some familiar faces were missing, notably those of Mr. T. Mervyn Jones and Mr. E. M. Edwards (both engaged elsewhere on important business), and a number of North Wales members, the gathering lacked none of its customary warmth. The weather was more favourable than usual, the technical fare was good, and the secretarial arrangements for the serious side of the proceedings and for the golf and bowls competitions and the two informal dances were carried out with that efficiency which we have come to associate with the Wales meeting.

Each of the seven district sections has its peculiar tradition. That of the 'Wales and Mon.' is its national sentiment, notwithstanding the fact that it has no monopoly of Welshmen. Apart from a strong contingent of 'trade' representatives, all those members on the supply side of the industry—mostly Englishmen, with a generous sprinkling of Scotsmen and a small number of Welsh-speaking Welshmen—are in the service of one board. That one board is unlike the other 11 in that the nationalised structure differs little from the pre-vesting day set-up so far as the relationships between the engineers and managers are concerned. Everybody is happy under the group committee system, and the prospects of changes in functions arising from increased bulk supplies and fewer manufacturing stations are being faced with confidence.

The Porthcawl meeting was the fourth spring meeting under the new constitution, but the 49th of the organisation which began as the Wales and Mon., Association, and as usual its chief feature was the Chairman's Address. This year Mr. K. E. Tiddy, who after service with the South Metropolitan Gas Company and with the Bedford, Hinckley, and Haverfordwest undertakings went to Carmarthen some time before nationalisation to take charge of a group of undertakings and thus became well fitted to preside over the Carmarthen group committee when it was formed in 1949, departed from the easier way of describing his own works, and covered a wide field of questions of concern to the gas engineer of today. Those questions ranged from the trend towards specialisation and the effects of integration to the usefulness of the local committees of the consultative council; from education and training to the advantages to be gained from extended approved dealer co-operation; and from the ever-widening range of methods of gas production (as exemplified in Wales) to the possibilities of milk bottle washing in all-gas dairies. Carmarthen is not an industrial area in the accepted sense, but Mr. Tiddy showed that a good deal of attention is paid to securing every possible industrial load. Almost every paragraph of his address contained at least one question mark. Some of the answers were obvious; to other questions there are no immediate answers, but Mr. Tiddy set them down in the hope that they might stimulate useful thought, perhaps along entirely different channels. He said he knew it was the wish of the Wales Gas Board that engineers should preserve their freedom of thought and speech he claimed to have taken full advantage of that freedom, a freedom which to him was a manifestation of a far-sighted policy and one which augured well for the future of the industry.

Of the two papers which constituted the rest of the technical programme, one was a summing-up of the purpose and possibilities of management training courses by Mr. H. Buckley, of Pontypool, who spoke from first-hand experience, and the other a detailed review of mains and service practice by Mr. G. Fitton, of Neath. The Section was as usual accorded a civic welcome by the Chairman of the Porthcawl Council, who, despite the fact that he was contesting a council election that day, found time not only to attend the morning session but to grace the official luncheon with his presence and a speech extolling the attractions of the town.

About 28,000 Industrial and Commercial consumers of coal, coke and oil will be freed from the need to make returns of their consumption and stocks as a result of a decision taken by the Minister of Fuel and Power. Since 1940 consumers of 100 tons a year or more of solid fuel have been required to make returns. From now onwards, Mr. Geoffrey Lloyd stated in reply to a Parliamentary Question on May 14, returns will be required only from the larger consumers (*i.e.*, consumers of 1,000 tons a year or more of coal or 200 tons a year or more of hard coke or 500 tons of oil). This will cut down the number of firms making returns by about three-quarters. The information still available to the Ministry will account for 88% of total industrial coal consumption and about 98% of hard coke consumption. The only change involved in published statistics is that the figures of industrial consumption will henceforward relate to the large consumers accounting for 88% of total consumption. Comparable figures will be given for earlier years.

Copies are now available from the Secretary of the Institution of Gas Engineers of the discussions on the Gas Council's Research Communications G.C.9/8 and G.C.13/12 presented at the Institution research meetings in November, 1952, and November, 1953, respectively. The price per copy is 1s. 6d.

'Gas Journal' Binding Cases and Binding.

An improved case, gold blocked, is to be supplied for binding the 'Gas Journal' as from January 1 of this year. Production costs have risen considerably over the past years and we are now compelled to fix a new price for cases at 7s.6d. each. For binding customers' *complete* copies of the '*Journal*' in our standard case the charge will be £1.10s. and for supplying a bound stock volume, which includes necessary copies of the '*Journal*', £2. Special binding to customers' own requirements will be priced according to the work involved.

Personal Notes

MR. R. ST. C. SANDALL has been appointed Assistant Secretary of the British Coking Industry Association.

MR. JAMES J. DAVY, M.A., of Dublin, has been co-opted a Director of the Alliance and Dublin Consumers' Gas Company, to fill the vacancy created by the death of the Rt. Hon. James M'Mahon, P.C.

MR. F. B. KEILLOR, Works Superintendent, Scottish Gas Board, has been appointed Manager of the Berwick-upon-Tweed undertaking of the Northern Gas Board, Blyth Division, in place of Mr. R. F. D. PAWLEY.

MR. JOSEPH WALTON, Joint Managing Director of Thos. W. Ward, Ltd., completed 50 years service with the Company on March 14; and at a dinner given in his honour at the Royal Victoria Hotel, Sheffield, recently, he was presented by the Directors with a silver rose bowl. Mrs. Walton received a diamond spray brooch. In making the presentation, Mr. Ashley S. Ward, President of the Company, referred to the fact that Mr. Walton commenced in the rail department as a youth and had been with that department ever since. Under his guidance, the department has laid railway sidings for some of the largest undertakings in the country.

SIR LAWRENCE BRAGG, O.B.E., M.C., F.R.S., and PROFESSOR H. W. MELVILLE, F.R.S., have been appointed by the Minister of Fuel and Power to be members of his Scientific Advisory Council from September 1 next. The Council was set up in 1948 to advise the Minister on the scientific aspect of his statutory duties. Sir Lawrence Bragg has been Fullerian Professor of Chemistry, Royal Institution, since 1953, and Resident Professor and Director of the laboratories of the Royal Institution since January. He was previously Cavendish Professor of Experimental Physics at Cambridge. Professor Melville has been Mason Professor of Chemistry, University of Birmingham, since 1948. He is a member of the Research Council of the British Electricity Authority, of the Fuel Research Board, and of the Ministry of Supply Scientific Advisory Council.

CAPTAIN G. WHITNEY DINES, Master of the M.V. 'Ben Harold Smith,' has retired after 24 years' service with the National Benzole Co., Ltd. He went to sea at 14, serving his apprenticeship on the River Thames and in coastwise shipping. At 22 he gained his first command, a new motor vessel from South Shields. He held that command throughout the 1914-18 war, seeing service with the Grand Fleet. In 1930 he joined the National Benzole Co., Ltd., as Mate of the tug 'Mystic,' of which his father was Master. On the death of his father he became Master and in the following year he was appointed to command the newly-built M.V. 'Ben Sadler,' the first self-propelled petroleum spirit craft to operate in the Thames. Captain Dines remained Master of the 'Ben Sadler' until November, 1952, when he took over the newly-commissioned M.V. 'Ben Harold Smith.' This vessel, which was built for Thames traffic, was named, as are the other vessels in the Company's fleet, after a Director of National Benzole Co., Ltd. A Freeman of the River Thames, Captain Dines received the Queen's Coronation Medal last year.

MR. DONALD SMITH, of Golspie, has been presented with a wireless set in recognition of his 42 years' service in the gas industry. The presentation was made by Mr. John Ford, Sub-Group Manager, Northern Division, Scottish Gas. Before retiring last autumn Mr. Smith had been Manager of the Golspie gas undertaking for 32 years. He is a native of Thurso.

Diary

May 19.—WALES JUNIORS (NORTH): Visit to Staveley Iron Works, Chesterfield.

May 19.—SCOTTISH G.C.C.: 26, Drumsheugh Gardens, Edinburgh, 11.30 a.m.

May 19-20.—GAS SALES AND SERVICE CONFERENCE. Floral Hall, Southport. The special train from Euston on May 18, will leave at 3.35 p.m., and not 3.25 p.m. as previously announced.

May 22.—SCOTTISH ASSOCIATION OF GAS MANAGERS' BOWLING CLUB *versus* SCOTTISH GAS BOARD BOWLING CLUB, Granton Gasworks Bowling Green, 2.30 p.m.

May 22.—SCOTTISH JUNIORS (EASTERN): Golf Outing, Carnoustie.

May 25.—LONDON AND COUNTIES COKE SALES CIRCLE: Annual Meeting, Gas Industry House, 1, Grosvenor Place, London, S.W.1, 2.45 p.m.

May 25.—WOMEN'S GAS FEDERATION: Annual General Meeting, Caxton Hall, Westminster.

May 27.—NORTH THAMES G.C.C.: Caxton Hall, Westminster.

May 28.—SCOTTISH JUNIORS (WESTERN): Visit to the Power-Gas Corporation, Ltd., Stockton-on-Tees.

May 28.—LONDON JUNIORS: Annual General Meeting. 178, Edgware Road. 6.30 p.m.

June 1.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, 2.15 p.m.

June 3.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

June 3.—MIDLAND JUNIORS: Ladies' Day.

June 5.—SCOTTISH JUNIORS (EASTERN): Annual Outing, Leven.

June 12.—MANCHESTER JUNIORS: Visit to Burnley Gasworks. 'The Design and Performance of 0.5 mill. cu.ft./day Tully Carburetted Complete Gasification Plant,' G. R. Spence, G. Wheatman and I. J. Harthill.

June 15. — LONDON AND SOUTHERN SECTION, I.G.E.: Summer Meeting.

Coke Sales Figures announced by the North Western Gas Board show that sales in April, at 28,700 tons a week, were 4.5% less than in April, 1953. The main setback was in sales to merchants, which averaged 11,800 tons a week; a fall of 9.3% compared with the corresponding period of 1953.

Fry's Metal Foundries, Ltd.—The second annual meeting of the Fry 25 Club took place at the Trocadero Restaurant, London, on Friday, April 30. Mr. John Fry, the President of the Club, was in the Chair. The opportunity was taken to drink toasts to Mr. W. H. Lawrence, who retired on March 31, and Mr. V. C. Woodroffe, who retires at the end of May.

Institute of General Managers

More than a hundred members and guests are expected to attend the first Midlands Dinner of the Institute of General Managers at the Grand Hotel, Birmingham, on Friday next. The list of guests include Mr. A. G. B. Owen, C.B.E., J.P., Chairman of the Owen Organisation, and Dr. Robert S. Aitken, Vice-Chancellor of the University of Birmingham.

The Institute was inaugurated in November last, when the guests included Sir Patrick Hannon, Sir Rupert De la Bere, BT., K.C.V.O., M.P., Mr. W. Robson Brown, M.P., and Mr. B. H. Leeson, C.B.E. Sir Rupert De la Bere concentrated his comments on the chief executives of industry, whom he described as a vital body of misunderstood men who, in fact, represented an important section of working democracy. Such men, however, must be brought together for their own good, to share their experience and talents, to ensure that they have a powerful corporate voice, and to train their successors.

'General management,' Sir Rupert added, 'draws to its service the best brains and offers greater opportunities of pay and prestige than any other profession. Industry today is seeking new leadership through increased management ability. With fresh problems and new emergencies on every hand, rule-of-thumb management will not do.'

Competent management holds first place. It is sought and rewarded to an extent impossible when conditions in industry and commerce were more stable. Ultimately, 'top management' determines the success or failure of any business. The general manager utilises manpower, materials, specialised ability, and capital to produce profits.

As an organisation devoted to the interests of general managers, the Institute is an exclusive body. No candidate for membership can be accepted who does not hold a *bona fide* general management appointment at the time of his application.

One of the basic concerns of the Institute is the education and training of the younger men—the potential general managers. The Institute, however, recognises that no amount of training and examination success can make a competent general manager. The potential general manager must possess the attributes of personality and leadership. The Institute defines a general manager or chief executive as being responsible for the overall leadership, planning, coordination, and control of all the managerial functions in an enterprise, ensuring that the various functional divisions work together as an efficient unit in accordance with what policy may be decided.

A provisional Council has been appointed pending the appointment of a Council of 36 or more members, including leading chief executives of all types of enterprise. Branches are being established in various centres throughout the British Commonwealth. Responsible executives with adequate qualifications should apply for further information to the Registrar, Institute of General Managers, 86, Eccleston Square, S.W.1.

Industrial Gas Conference, 1954

Nearly 300 members of the gas industry from all parts of the country were entertained at luncheon at the Chesford Grange Hotel, Kenilworth, on May 10, under the presidency of Sir Harold Smith (Chairman of the Gas Council). The gathering marked the opening of the Council's Industrial Gas Conference programmed for two days at Leamington.

In the course of his remarks, **Sir Harold Smith** explained that the industrial applications of gas account for about one-quarter of the gas industry's total sales every year, the while the demands of industry for gaseous fuel continue to rise. Indeed, the total quantity of gas now being purchased by industrial users each year is considerably more than double that bought in the years immediately prior to the war.

Sir Harold went on to comment that figures showed that gas is needed in modern industrial processes and that industry recognises that in gas it has a fuel with outstanding advantages. Its speed, he said, allows any required temperature to be reached without unnecessary delay; its flexibility opens up its use for a very wide variety of applications; its controllability enables the user to regulate furnace temperatures and atmospheres within fine limits; its cleanliness makes for better working conditions. In short, gas provides the industrialist with a refined fuel, constant in supply. Sir Harold Smith mentioned that, so far, the gas industry has relied on coal. The price of coal to the gas industry has increased since 1938 by about 300% at pit. Putting it another way, the industry's coal bill to-day is costing it £29 mill. a year more than it would have cost if coal prices of five years ago were operative to-day.

Rise in production costs, he added, has not been passed on to the consumer. The average price of gas throughout the country is not even double what it was before the war. 'We are,' he said, 'striving to meet the increase in coal costs in four ways. First, by increasing the efficiency of the gas-making process and by spreading this improvement over wider areas by means of integration and the closing-down of small and uneconomic works. Secondly, by developing satisfactory methods whereby we can gasify coals which are plentiful, but not of good gas-making quality. Thirdly, by the production and use of gas from sources other than coal. Finally, by exploring the possibilities of finding natural gas in commercial quantities. We have already achieved worthwhile results in some of these directions and are hopeful as regards the future. But we cannot and must not rely on research to provide the complete answer to our problems. We must strengthen our advisory service to industry and improve the design and efficiency of gas-consuming equipment.'

Gas and the Steel Industry

Mr. E. Julian Pode, Managing Director of the Steel Company of Wales, gave an address on 'Gas and the Steel Industry.' To gain some idea of the problems concerned with the manufacture and supply of gas in relation to the two industries, he said, it is necessary to regard the broader picture and consider the interests involved.

The carbonising of coal and manufacture of gas, he continued, was carried out by two main industries—the gas industry on the one hand and the coking industry on the other. The coking industry required some explanation. It comprised coke oven plant owned and operated by the National Coal Board, the iron and steel industry, and certain independent undertakings. The coking industry was a distinct industry and was bound together by the British Coking Industry Association, whose membership took account of its various interests. The coke oven industry carbonised annually 26 mill. tons of coal. Output was divided as follows:—

National Coal Board with 50 plants, 10 mill.
Iron and steel industry, 24 plants, 13¼ mill.
Independent owners, 8 plants, 2¼ mill.

Looking at the matter another way, in the whole of the coking plants of the country there was made, in thousands of cubic feet, 280 mill., which was disposed of in 1953 as follows:—

	(1,000 cu.ft.)
(i) At coking plants ...	119 mill.
(ii) At collieries and associated steelworks	79 mill.
(iii) Supplied to gas undertakings, 6 8 mill.	
Supplied to other consumers, 5 mill.	73 mill.
(iv) Total disposals ...	271 mill.
(v) Gas bled to waste ...	8½ mill.
(vi) Metering differences	½ mill.
(vii) Total gas made ...	280 mill.

The carbonising industries, continued Mr. Pode, have varying functions in relation to the gas problem. The gas industry makes, buys, and distributes gas. The iron and steel industry makes, consumes, and sells gas on the one hand, while purchasing it on the other. The colliery branch of the coking industry merely makes gas and sells it wholesale.

The common denominator of the three industries is that they make gas. The particular duty, and indeed the statutory obligation of the gas industry is distribution. A considerable quantity of coke oven gas is sold to the gas boards.

What about the composite iron and steel plants *vis-a-vis* the gas industry? Mr. Pode said that he did not propose to dwell with the questions that arose with the steel industry as a buyer of gas. In Sheffield, the iron and steel industry was an important customer of the gas industry.

Mr. Pode continued: In the United Kingdom, a completely integrated composite iron and steel plant normally consists of coke ovens, blast furnaces, steel furnaces, primary and secondary rolling mills, together with the necessary reheating furnaces and other ancillary plant, including a power station. In comparing one plant with another, there are wide differences. Some plants are considerable sellers of coke on balance. Many others are large net buyers of coke. The fact remains that it is necessary to use a ton of coke to manufacture a ton of pig iron. If we assume that the manufacture of a ton of coke produces 16,000 cu.ft. of coke oven gas with a thermal value of 475 B.Th.U. per cu.ft. and the smelting of a ton of pig iron produces 120,000 cu.ft. of blast furnace gas with a value of approximately 100 B.Th.U. per cu.ft., the gross value of both the gases may well be equivalent to 50s. per ton in comparison with the value of the hot metal produced of £14 7s. per ton.

Why, it may well be asked, does a composite iron and steel works part with a single cubic foot of gas? I think the underlying reasons for this are technical and commercial. Blast furnace gas, by reason of its low calorific value, has a limited application but it can be used successfully in high-pressure power station boilers, in soaking pits, and in the heating of coke ovens.

I had the pleasure, on behalf of my Company, of conducting negotiations with Mr. Mervyn Jones, Chairman of the Wales Gas Board, and to arrive at a contract over a considerable period of years. I believe that this arrangement will prove to the mutual advantage of gas consumers in South Wales, the Wales Gas Board, and the Steel Company.

Fuel economy is a major problem. Parliament has created the National Industrial Fuel Efficiency Service, on the Board of which body I have the pleasure of serving. The activities of this service are at the moment largely concerned with the economical use of solid fuel by smaller manufacturers. This, however, is a start towards greater fuel conservation.

The Solid Smokeless Fuel Federation, which both the gas industry and the coke oven industry support, has, of course, for its object the encouragement of the use of smokeless fuel. The iron and steel industry has for disposal a considerable quantity of the smaller sizes of hard coke, which modern practice has shown to be unsuitable for charging into blast furnaces. Here the gas industry and the iron and steel industry have common interest in the orderly marketing of this fuel.

The party then proceeded to Castle Bromwich for a tour of the British Industries Fair. [A report of the subsequent proceedings will appear in a later issue of the 'GAS JOURNAL.']

Brighouse Goes on the Grid

The North Eastern Gas Board, having decided that Brighouse can be supplied with gas much more economically through the grid system, has closed down the Brighouse gasworks and has thus brought to an end over a century of coal gas manufacture in the town. It is intended, nevertheless, to retain the site as a holder station and for the manufacture of water gas. Alternative employment has been offered to the majority of the employees at the plant.

The gas for Brighouse will in future come from a network of mains fed from coke ovens in several parts of the West Riding and the Tingley gasworks. It is yet to be decided whether the Brighouse plant will be dismantled. The works were valued at about £240,000 in 1948, but the amount of compensation received by the Corporation for the loss of the undertaking on nationalisation was only about £15,000.

Institution of Gas Engineers

Wales and Mon. Meet at Porthcawl

After an interval of six years the Wales and Monmouthshire Section of the Institution of Gas Engineers revisited Porthcawl for its spring meeting on May 13 and 14, under the Chairmanship of Mr. K. E. Tiddy, Engineer, Manager, and Secretary of the Carmarthen undertaking and Chairman and Convener of the Carmarthen Group Committee. There was a full programme on the first day, comprising the Chairman's Address, two papers, and the official luncheon, but the members relaxed in the evening for an enjoyable dinner-dance, and spent the second day at golf and bowls.

The technical sessions were held at the Grand Pavilion, where Councillor R. P. TUBERVILLE-DEERE, J.P., Chairman of the Porthcawl Urban District Council, accorded the Section a civic welcome. He mentioned that the Porthcawl lighthouse was one of the few remaining lighthouses round our coasts still lit by gas. It was council election day in the town, and Councillor Tuberville-Deere hurried away from the meeting to pursue his own election campaign.

Visit of I.G.E. President

The CHAIRMAN extended a cordial welcome to Mr. J. T. Haynes, President of the Institution of Gas Engineers, Major C. G. Hyde, Assistant Secretary, Ministry of Fuel and Power, Mr. W. R. G. Bell, Principal, Gas Supplies, and Mr. R. S. Snelling, Deputy Chairman of the Wales Gas Board.

MR. J. POWDRILL, M.B.E., Hon. Secretary, reported apologies for absence from Mr. Geoffrey Lloyd, Minister of Fuel and Power, Mr. J. S. Smith, Assistant Secretary, Ministry of Fuel and Power, Dr. A. B. Badger, Industrial Relations Officer, Gas Council, Dr. A. Marsden, O.B.E., Area Scientist, South Western Gas Board, Mr. T. Mervyn Jones, Chairman, Wales Gas Board, Mr. E. M. Edwards, Member, Wales Gas Board, and the Chairmen and Secretaries of the other district sections.

On the recommendation of the Management Committee the following were elected to membership: R. D. Briggs (Denbigh); A. Facer (Pontypool); F. Richmond (Grangetown, Cardiff); T. E. Tyrrell (Cardiff); F. Gwyther Boardman (Neath); and C. R. Monroe (Cardiff).

Certificates gained in the Institution of Gas Engineers examinations were presented to the successful Wales students by the Chairman.

MR. HAYNES said he could not let the occasion pass without offering his congratulations to the successful students. Each certificate, he pointed out, bore his signature as President. 'I want you to appreciate,' he said, 'that I did not put down my name lightly. I felt really gratified that I could sign in each case a document testifying that the student concerned had succeeded in passing the examination of the Institution.' It marked a further step forward on the ladder of success in the industry.

Tribute to Mr. Tiddy

MR. TIDDY then delivered his Chairman's Address (see p. 429).

MR. S. L. WRIGHT (Gas Engineer, Wales Board), proposing a vote of thanks to Mr. Tiddy for his address, said the manner in which he presided over the meeting at Carmarthen last September was a happy augury for the success of his year of office. His address had worthily upheld his reputation. He had fulfilled his task with credit to himself and to the Section. He recalled that Mr. Tiddy started his career in the gas industry with the old South Metropolitan Gas Company, and he went from there to Bedford where, as a result of his studies in steam raising, he gained the Diploma of the Institution. He then went to Hinckley, an undertaking associated with early experiments in the disposal of effluent liquors. He next went to Haverfordwest as manager of an undertaking of an ideal size for the study of management, where the manager had to keep his finger on everything that was going on. Then he proceeded to Carmarthen where, before vesting day, he was manager of a group of undertakings. It was no wonder, therefore, that when the gas industry was nationalised he was selected as Chairman of the Carmarthen group committee.

In his address he had covered a wide field of subjects of great concern to gas engineers, and he had displayed his particular interest in management by persuading Mr. Buckley to present a paper on the purpose and possibilities of management training courses. His remarks on the preparation and marketing of coke were timely and helpful, and he had rightly ended with a reference to the work of the gas consultative council. He had made no claim to be a specialist, but he felt Mr. Tiddy was a specialist in being able to deal with such a wide variety of interests.

MR. W. F. EDWARDS (Port Talbot), in seconding the vote of thanks, said Mr. Tidy might well have taken the easy course in saying something about his own undertaking, but he had, instead, given an impressive review of their interests, their hopes, and their ambitions in the industry they sought to serve.

Two Papers

MR. H. BUCKLEY, Deputy General Manager and Engineer, Pontypool, then presented a paper on 'Management Courses, their Purpose and Possibilities,' for which he was accorded a vote of thanks on the proposition of MR. J. POWDRILL, seconded by MR. O. P. CRONSHAW. (See p. 436.)

After the luncheon interval, Mr. G. Fitton, Engineer and Manager, Neath, read a paper on 'Aspects of Mains and Service Practice' (p. 431). A vote of thanks was accorded to Mr. Fitton on the proposition of Mr. J. F. Rut (Newport), seconded by Mr. S. D. Coole (Barry).

MR. J. T. HAYNES supported the vote of thanks and said he had been impressed with the excellent standard of papers and discussion during the meeting.

A vote of thanks was accorded to Mr. Tiddy for his duties in the chair, on the proposition of MR. W. CLARK JACKSON.

The Official Luncheon

Between the morning and afternoon sessions, the official luncheon was held at the Seabank Hotel.

MR. J. T. HAYNES, President of the Institution of Gas Engineers, proposed the toast of the Wales and Monmouthshire Section and congratulated the Section on the generous donation it had made to the Benevolent Fund during the past year. Less than 50% of the members of the Institution, he said, were making regular contributions to the Fund. On the inspiration of a member of the Benevolent Fund Committee he had sent out a letter to all who were not contributing, and he hoped very few of his audience were among those who would receive a letter. He reminded them, however, of the changed value of money in these days and suggested that those who had been giving a guinea a year should explore the possibility of doubling it.

Upholding Traditions

He complimented the Section on upholding its traditions and on the way in which its members had made use of the sources of heat for the benefit of their fellow men. They had done so in an amazing degree in Wales, where they made use of coke oven gas, methane gas from the mines, and butane/air, in addition to coal gas. They were working together in groups and he congratulated them on the way in which they were pulling their weight not only for the good of Wales or of the Institution, but of the general public whom they were out to serve. He claimed a spiritual brotherhood with them, having come from Liverpool, reputed to be the capital of North Wales. The Section was fortunate in having as its Chairman Mr. Tiddy, who had had both company and group experience.

MR. TIDDY, replying, said the Section was honoured in having Mr. Haynes as its principal guest. Although the Institution was old, gas engineering was young and virile in outlook, and Mr. Haynes had proved himself very worthy of the honour which the Institution had conferred on him. They had been proud of the old Wales and Monmouthshire Association, and they were no less proud of their organisation now that it was a Section of the Institution, and they hoped they would always play their part in upholding the traditions of the Institution. He expressed his thanks to Mr. Powdrill who, as Hon. Secretary, had been largely responsible for the success of the meeting.

MR. A. PICKARD (Swansea) proposed the toast of 'The Prosperity of Porthcawl,' recalling that the last time they visited that attractive resort was when Mr. E. M. Edwards was President of the former Wales and Monmouthshire Association. On behalf of the members he expressed warm appreciation of the facilities placed at their disposal, not the least being the use of the municipal bowling green.

Councillor R. P. TUBERVILLE-DEERE, J.P., Chairman of the Porthcawl U.D.C., replied and spoke of the growing popularity of Porthcawl as a venue for conferences.

MR. J. H. CHAPMAN (Swansea) proposed the toast of the guests, and said the Section was always fortunate in the support it received from local authorities, the Ministry of Fuel and Power, and the Wales Gas Board. Chief among the guests he mentioned Mr. Haynes, Mr. King Davies (Clerk of the Porthcawl U.D.C.), Major C. G. Hyde (Assistant

Secretary, Ministry of Fuel and Power), Mr. W. R. G. Bell (Principal Gas Supplies), and Mr. J. W. Davies (Senior Officer for Wales).

In the absence of Alderman Huw T. Edwards (part-time member of the Wales Gas Board), Major C. G. Hyde briefly and humorously responded to the toast.

The usual golf competitions for the Dean Cup and the Upjohn Cup were played on the Friday on the Royal Porthcawl Golf Course, Mr. A. G. E. Sadler being responsible for the very successful arrangements. Winner of the Dean Cup was Mr. Darrell Rees and of the Upjohn Cup Mr. W. C. Jackson.

The bowls competition for the Holmes Hunt Rose Bowl was played on the municipal bowling green at Griffin Park, the arrangements being well carried out by Mr. D. S. Davies. Mr. H. Short was winner of the Cup. Both Mr. Short and the runner-up, Mr. C. Hogg, received silver tankards.

EASTERN JUNIORS A.G.M.

At the well-attended Annual General Meeting of the Association, held in Dovercourt on May 8 under the presidency of Mr. F. J. Denny (Ipswich), it was proposed that Mr. Reg Hilham, who is relinquishing the task of Hon. Secretary and Treasurer, be elected to Life Honorary Membership. The proposal from the Chair, seconded by Mr. L. C. Coleman (Ipswich), was received with enthusiasm.

Mr. R. W. Hilham, who is Distribution and Sales Manager to the Colchester Group, has been Hon. Secretary of the Eastern Juniors since their foundation in 1929, and was in fact Secretary of the *ad hoc* Committee who planned matters in 1928. Mr. Hilham, in his honoured category, will join Mr. J. Hunter-Rioch, the proposer and founder of the Association. The latter, drawing members from a wide area and many small works, is comparatively young in years; but its rapid progress to maturity was largely due to the hard work and organising ability of Mr. Hilham. His successor will be Mr. H. E. Wilks (Watford), assisted by Mr. D. F. Rudge (Lincoln).

Reg Hilham

Other officers announced for the 1954-55 session were:

President:	R. F. Robinson (Watford)
Senior Vice-President:	F. G. Cox (Norwich
Junior Vice-President:	E. S. Dennis (Colchester)
Council (2 members):	J. L. Ireland (Lincoln)
	A. B. Scott (Cromer)

The following were elected to serve on the Eastern District (I.G.E.) Gas Education Committee: R. W. Hilham (Colchester), D. G. Simpson (Watford), and E. H. Winch (Cambridge).

After a vote of thanks to Mr. Denny for his hard work during a most successful presidency, the meeting was treated to a short but most lively address on 'Legal Aspects of the Gas Act,' by Mr. D. M. Cox, Solicitor to the Eastern Gas Board. Further reference to this will be made in a later issue of the 'Gas Journal.'

Members then joined the ladies for lunch, where Mr. Denny proposed the toast of the Eastern Gas Board, to which Mr. R. Whiting replied in the absence of Mr. W. J. Collins Garrard, G.M., Ipswich Division.

Afterwards, a tour of the Trinity House depôt, stores, and lightships in Harwich Harbour brought to a close a successful meeting—in the usual perfect Eastern Junior weather.

A Visit to B.C.U.R.A.

Through the courtesy of the British Coal Utilisation Research Association 114 members of the London and Counties Coke Sales Circle recently visited the Experimental Station at Leatherhead, spending a day there as the guests of the Association.

On arrival, small parties were formed and were taken on short conducted tours of the Station by guides who explained the principal features of each section. Each guest was also given a copy of a brochure, which had been specially prepared for the visit, containing a brief explanation of the layout of the Station and its activities.

After the tours, members were free to re-visit any part of the Station they wished and to see all the work in progress in the various departments. Full advantage was taken of this facility, and the Circle enjoyed the opportunity of seeing something of the research work being carried out on such subjects as fuel efficiency, utilisation of low-grade fuels, correct choice of fuels, atmospheric pollution, the fundamental nature of coal, and kindred questions.

Luncheon and tea were provided, and after tea the Circle was welcomed by Mr. J. S. Hales, on behalf of Dr. D.T. A. Townend (Director-General of the Association), who was unable to be present. The Chairman of the Coke Sales Circle, Mr. D. G. Rose, replied.

Gas Board's Gift to Coventry

The West Midlands Gas Board has asked Coventry City Council to accept a gift of a new badge for use by the Lord Mayor on ceremonial occasions. The gift is intended to mark the conferment by the Queen of a Lord Mayoralty on the city last year. It will be of the same design as the badge now worn by the Lord Mayor on non-ceremonial occasions.

Mr. F. H. Cureton, Secretary of the West Midlands Gas Board, said that the Board felt the conferment of a Lord Mayoralty on Coventry was an event it could properly commemorate with a gift.

'I appreciate a board such as ours cannot do anything of this sort without criticism and suggestions of an unwarranted expenditure,' he said, 'but I do not think it is an action the Board should apologise for. It must be remembered that the Board took over, in Coventry's gas undertaking, a very important asset and that there is at Coventry the second largest gas manufacturing station in the Board's area.

'The Board has considerable connection with Coventry and enjoys very good relations with the city. It has probably more justification for making a gift to Coventry than, say, the City of Birmingham which gave a loving cup.'

The Coventry Council's General Purposes Committee are to recommend the Council to accept the gift with thanks.

MANCHESTER GOLF CIRCLE

The Manchester and District Golf Circle spring meeting was held at the Fairhaven Golf Club on April 27, when a good attendance of members enjoyed an excellent day's golf in beautiful weather. The cup was won by Mr. John Drake with a net 72. Mr. W. Foster and Mr. E. Clay were runners-up with net scores of 75. The winners in the afternoon bogey competition were Mr. W. Foster and Mr. W. H. Elkington. The winner of the cup, Mr. John Drake, is in the centre of the group with the Captain of the Golf Circle, Mr. Jack Richmond, on his left.

British Gas Staff Association Conference

National officials and nearly 400 delegates representing the 17,650 members from all parts of the country spent two full days at the annual conference of the British Gas Staff Association at Bournemouth on May 14 and 15. They were accorded a civic welcome at their opening session and when they reassembled on the Saturday morning they were addressed by Mr. J. T. Haynes, President of the Institution of Gas Engineers. They were also the guests of the Mayor at a reception at the Town Hall on the Friday evening, at which Mr. A. R. McBain, Chairman of the Southern Gas Board, joined in offering good wishes.

Councillor H. P. E. MEARS, O.B.E., J.P., Mayor of Bournemouth, in welcoming the delegates at the Town Hall, told them he had nothing against gas except the cost of it, adding, 'I get a lot of it for nothing in the council chamber.'

Years of High Endeavour

MR. W. E. WEBB, in his address as Chairman of the Association, said interest in the conference grew steadily each year, and it was pleasing to note the large number of delegates who were attending for the first time. He hoped they would not only find the debates interesting and instructive but that they themselves would take an energetic part in discussions. He trusted too they would enjoy to the full the happy and congenial social atmosphere which had always been such a notable feature of these gatherings. It was good also to note the leavening of delegates present who had attended many previous conferences.

The past year had been one of high endeavour, of steady progress in all fields, and of some very solid achievement of satisfactory and lasting benefit to members. Despite normal wastage, the membership had continued to increase and branch officers had shown commendable ability and enthusiasm in the performance of their duties.

The increase secured in national salary scales was the result of good team work by the National Staff Joint Council and the National Committee for Intermediate Grades, in both of which the B.G.S.A. played an important and prominent part. Steps had been taken during the year to improve the conditions of service of intermediate grades and a considerable number had been granted staff status, by the introduction of new scales.

Co-operation and Some Friction

Among the many other matters which were receiving attention were London weighting, revision of the overtime agreement, and a cost of living increase for the unfortunate pensioners. They had continued to co-operate with the other trade unions in negotiations with the Gas Council and area boards, but there had been some friction about other matters which had been detailed in the Secretary's annual report, and which they would have an opportunity to debate.

Relations between the Gas Council, the area boards, and the B.G.S.A. had been on a friendly and co-operative basis, and it was clear that some area boards had increasingly appreciated their desire for even closer co-operation.

The announcement that the Gas Council had instituted a search in Great Britain for sources of natural gas had evoked widespread interest within and without the gas industry, and gas staffs everywhere would join in wishing the Gas Council success in this bold enterprise.

The Efficiency Drive

One of the highlights of the year was the move to increase and improve joint consultation as a general and permanent feature throughout the gas industry. In October Colonel Sir Harold Smith, Chairman of the Gas Council, convened in London a joint conference with the trade unions on 'Efficiency in the Gas Industry.' Sir Harold said 'They had met to see what they could do to achieve greater efficiency and thereby a reduction in the price of gas, and one way of doing this was through the Joint Consultative Committees.'

Mr. Webb went on to say that on behalf of the Association he had no hesitation in pledging full support. To be effective joint consultation must be free, full and frank, and it would be their duty to see that their representatives were of the best possible types and that they were fully instructed in what they were to do. They would have an important and responsible task to perform which would demand their closest attention. If properly used the consultative committees should prove an enormous asset to the gas industry, but he would add a word of advice—'if your committee is not working satisfactorily please tell us, for we are determined to take all possible steps to ensure that management and staff co-operate in these committees for the benefit of the industry and its consumers.'

The B.G.S.A. believed that, as well as being consulted, the employees should be granted some representation on the boards so that the public service might be run truly as a partnership of management, consumers, and employees.

'Slap-Happy' Coal Increase

It was unfortunate that at this juncture when the gas industry was going all out to maintain, or even reduce, the price of gas, the country should be faced by another of those 'slap happy' increases by the National Coal Board in the prices of its commodity, which would add a further burden of £4 mill. to the gas industry. The National Coal Board must realise it could not for ever go on 'passing the buck' to others, and they would like to see some evidence of a serious effort to hold coal prices in check.

The easing of some restrictions on hire purchase had proved helpful, but the continuance of purchase tax on some gas appliances was a constant source of irritation to the housewife and acted as a brake on the wheels of business and trade.

In particular it was difficult to find any justification for the tax on water heaters, and they would urge the Government to put a speedy end to this tax which operated so harshly against the citizen of moderate means.

The B.G.S.A. journal *Thermfare* continued its good work as the spearhead of opinion, and suggestions for enlarging its size and scope were under constant review. The editor and committee deserved appreciation, but he felt sure they would welcome a greater variety of news and views from the branches which might have a much wider appeal and might also be of great interest to others.

Yeoman Service

In conclusion Mr. Webb thanked the Vice-Chairman, Mr. C. C. Holt, and the members of the National Council for the excellent services they had rendered throughout the year and for the invariable courtesy which they had accorded to him as Chairman. It was a matter of regret that some members of the National Council were for various reasons retiring this year, and in the name of the B.G.S.A. he tendered to them their grateful appreciation of their meritorious services to the B.G.S.A.

The officers and staff had again rendered yeoman service. The Secretary, Mr. Henfrey-Smith, had distinguished himself on a number of occasions, and the smooth working of the Association was in itself a tribute to his efficiency and tact. Mr. Arnold, ever looking for new fields to conquer, had had a busy year, while the Financial Officer, Mr. Robson, despite heavy financial commitments this year, had successfully contrived a favourable balance. The area organisers had been joined by their new colleague, Mr. Tune, and all had been commended for their good work.

The prestige of the B.G.S.A. had never stood higher than it did today. He was confident they would not only maintain but would continue to raise the standard.

When the second day's proceedings opened, Mr. WEBB welcomed on the platform Mr. J. T. Haynes, Mr. J. C. Hogg (General Manager of the Bournemouth Group), Mr. H. K. Wilkes (Group Accountant), and Mr. Crittenden (Sales and Service Officer).

The Right Spirit

Mr. J. T. HAYNES said he was present in two capacities—first as President of the Institution of Gas Engineers, and secondly as Divisional General Manager of the Southern Gas Board's Western Division. Although the old Bournemouth Gas and Water Company, which he had the honour of serving for several years, no longer existed under that name it was still very much alive in spirit. In his latter capacity he was concerned with administration and executive authority, and in that capacity he had come very directly into touch with the British Gas Staff Association as a member of the Area Joint Council for Gas Staffs. He had had some good tussles and some very interesting times in that council.

A man was known by the company he kept, and similarly a trade union was known by the spirit of its members, and it was because the spirit of their members in the Bournemouth area, with whom he came into contact, was so good and so happy that those who were concerned with the executive and administrative side of the gas industry held the Association in such esteem. He welcomed the opportunity to pay tribute to one of their members who had been chairman of the Bournemouth branch of the Association since its inception until he retired a few months ago to give place to a younger man—he referred to Mr. Herbert Simmonds. Their regard for each other developed in earlier times of difficulty and stress, and in more recent years they had been able to get together and discuss difficulties which they saw lying ahead, so that they had been able to avoid many of the problems with which the Association had been bothered in some other parts of the country. That friendly spirit had enabled Bournemouth to be one of the least troublesome branches of the Association.

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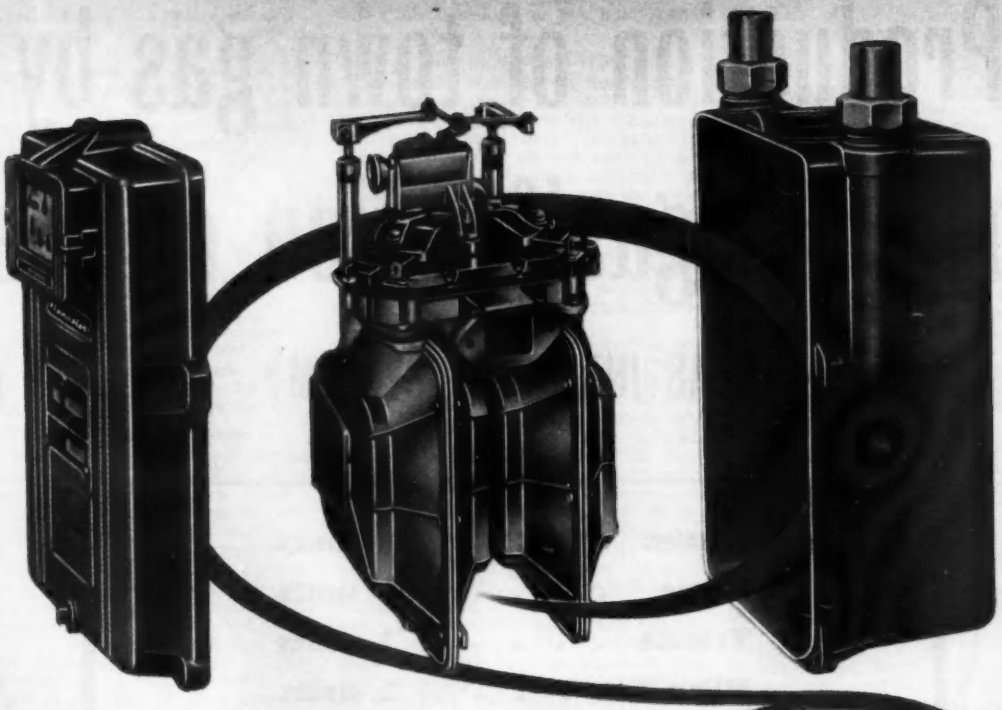

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A SURVEY OF THE INDUSTRY IN WALES

FROM AN ADDRESS AS CHAIRMAN OF THE WALES AND MONMOUTHSHIRE SECTION OF THE INSTITUTION OF GAS ENGINEERS ON MAY 13, 1954, BY

K. E. TIDDY,

M.Inst.Gas E., Chairman, Carmarthen Group, Wales Gas Board.

An engineer running a gas undertaking and acting as Group Chairman to a group of undertakings in a corner of Wales must necessarily have a somewhat limited view of what is going on elsewhere. However, many small parts make a whole, and it is beneficial that now and then the small parts shall be exposed to the light of day.

The Effect of Nationalisation

How has the gas engineer fared since nationalisation? Since May, 1949, there have, of course, been changes in status and in certain conditions of employment. We in Wales have perhaps been fortunate. By and large, though no doubt with some exceptions, the transfer from private enterprise to public ownership has been achieved with a minimum disturbance to the personal well-being of the professional personnel of the gas industry. The top jobs are certainly bigger and more numerous, but they do not seem to carry proportionately greater salaries; and I would say that the outstandingly brilliant man might feel that the salary ceiling in the gas industry was too low to attract his efforts. Today we hear much about atomic energy, and I have no doubt that in due course we shall have electricity and perhaps other forms of heat derived from this source. This factor, however, should not be allowed too much weight in assessing the future of the gas industry as a career. Atomic power could undoubtedly save coal, but there is no evidence to suggest that it would so cheapen the production of electricity as materially to alter the competitive position of the gas industry. There are many processes for which gas is much more suitable than electricity, irrespective of cost. Moreover, gas manufacture is really a chemical process, and as such must always play an important part in the national economy. As scientific opinion overcomes traditional prejudices, the importance of the industry will increase. Young men who enter it can do so with every confidence in the future.

We are living in an age of specialisation. I am not quite happy about this. The specialist has his limitations. I believe there was much to be said for the qualities and experience which went to make up the type of gas engineer of the past.

The distribution engineer can certainly derive advantages from the present trend. Centralisation of manufacture calls more and more for skill and training; and this side of our work has never received its proper measure of recognition. The number of candidates taking the Institution of Gas Engineers examinations in distribution subjects continues to be too small in relation to the number taking the examinations in manufacture. In industrial utilisation, too, it would appear that there is going to be a wide field of opportunity.

Efforts made for the Young

Great efforts have been made to provide adequate facilities for the education and training of the young man. All area boards have their education schemes under which young men follow properly organised courses, usually at colleges. Time off is allowed for study during the day, travelling expenses are paid, and even subsistence allowances are granted. Reasonable salaries are offered during the period of training, and when the young man has emerged successfully promotion is assured. All this has resulted in a steady flow of candidates for the Institution examinations. Candidates who have studied under much easier conditions than would have been the case many years ago should be fresher, better informed, and better equipped. Yet for the past year or so we have consistently seen reports from the Board of Examiners indicating dissatisfaction with the candidates' examination performance. The pendulum may have swung too far and things may have been made too easy. In the old days a good deal of determination was needed to achieve qualification in the teeth of difficulties. Study was confined to 'leisure' hours. Fares and fees had to be met from meagre earnings. Has the easing of these conditions resulted in a lessening of the determination to overcome difficulties or a lack of appreciation of the advantages now offered? Our industry is, of course, not alone in regard to this improvement in facilities for study. The new Institution Regulations calling for more ancillary subjects to be studied to a higher standard, thereby protracting the period of the course of study, were greeted by some of us with mixed feelings. I feel that it is good to have the position tidied-up as between ourselves and the Institutions of Civil and Mechanical Engineers. A student knows that he can now adopt a course of study parts of which are academically equally applicable to other professional engineering institutions. I feel, too, that the new Regulations give a proper status to the Institution of Gas Engineers examinations, which are now manifestly of as high a standard as are those of other professional bodies.

Let us examine, however, the case of a student who, having obtained his National Certificate, is moved to an area where no technical college is available. Such a student must either go on working for Higher National without the aid of a college (that is, by private study or correspondence) or take the examination all over again with the Institution of Gas Engineers We have many such cases in Wales. Gaining a National or even a Higher National Certificate by attending college is nothing like so difficult an undertaking as it is to pass the equivalent Institution examinations by private study. I do not suggest that one necessarily learns more at a technical college, but somehow the passing of the examination itself seems a much easier proposition. The 'home study' class of student is heavily handicapped, and I am wondering if something cannot be worked out to ease his position.

The Safety-first Complex

I would query, too, whether we are tending to encourage a safety-first complex—steady promotion and a pension. What of the spirit of adventure, the urge to take a chance that will bring off something really big? I trust everything possible will be done to foster this spirit and to guard against developing an attitude of 'sit tight and don't make a mistake!' The man who never made a mistake, we are told, never made anything.

Most of the senior members of the industry are in some capacity or other called upon to exercise the function of management, and recently a number of young men have been sent by the area boards on a course designed to improve their capacity for this all-important function. The art of management has always struck me as a combination of two qualities—the exercise of common-sense and of human contact. These two items cover a host of minor ones. I believe that management has improved and is improving continually, which is a measure of the way the area boards have been carrying out their task. Large organisations, however, have some disadvantages to offset against their advantages, and in my opinion there will always be a danger that the human element may not receive sufficient consideration, or again that too many cooks may be allowed to spoil the broth Up to the present both these inherent tendencies have been kept within

reasonable bounds, and I have every confidence that this will continue to be the case.

Manufacture and Production

In Wales we were aware that before long most of the gas we sold would in fact be bought in bulk. We know of the G.I. process of complete gasification. The idea underlying this process is not new; but certain modifications have been introduced which, it is felt, will show improvement on results hitherto obtained. Complete gasification, if it can be made economic, has much to recommend it. We should be able to use more of the weakly caking coals. A significant point is that gas produced as a result of complete gasification does not carry the obligation to find a market for coke.

A method which seems to hold out much promise is the 'Rochdale' process. The effect of this process on capital charges, on thermal yield, on coke yield, and on peak-load production appears to have great possibilities — to say nothing of the possibility of carbonising classes of coal hitherto regarded as unsuitable for vertical retorts, and of improving the combustion characteristics of the resultant coke by the blending of different types of coals. Then we have drainage of methane from collieries, one of which schemes is being undertaken by the Wales Gas Board; and the Gas Council has started its investigation on natural gas, a project which I am sure we all of us feel was bold in its inception and deserving of success.

For the smaller works, too far from large undertakings to receive integrated supplies, we envisage propane/air or other propane mixtures; and where no gas undertaking is at present in existence the supply of neat propane or grid gas. In connection with these small works I have often wondered whether it might not be a good idea to design for peak loads a small self-contained oil gas producer gas plant. This would consist of one or more retorts suitable for carbonising oil. They would have to be heated by gas from the producer, the bulk of the gas from which, however, would be used for dilution, possibly passing through the retort to assist the removal of the oil gas.

Removal of organic sulphur is of current interest. Schemes of integration will doubtless bring in their train new problems. With the grid in Wales, fed by unpurified coke oven gas, there are the problems of purification and dilution of large quantities of rich crude gas, interchangeability of gas supplied from different sources, and stand-by plant and peak load plant.

Can we look forward with confidence to improvements in the production of coke?

The product we market is reasonably satisfactory, but it should be improved. All coke should be graded; but even graded coke could be more easily ignitible and combustible than it is at present. The price of coke has risen sharply in recent years. If we are to retain the coke market we must improve the quality of coke.

Since 1949 the area boards have improved distribution systems. Many undertakings have been busy keeping pace with the rapid growth of council estates. This has involved considerable expenditure of capital on mains and services at a time of high prices. In many instances the increase in consumption which should have followed has been negatived by the loss in consumption due to houses being no longer inhabited. Modern housing estates are laid out in a more spacious manner than formerly. This involves us in greater expenditure on mains and services. In a small undertaking where comparatively large estates have been built the effect has been substantially to increase the average capital charges per therm sold. Choice of fuel is largely dominated by local considerations. It says much for the strong competitive position of our product that in about 95% of cases the fuel chosen is gas.

In tariffs our competitors have made full use of the near monopoly which they have established in lighting. The difference between the 5d. per unit charged in Wales for the first 10 units per room and the 0.85d. per unit charged for the remainder is such as virtually to give a compulsory two-part tariff. To translate this into terms of gas would involve something like 10s. per therm for the first 2½ therms and 2s. per therm thereafter. I think we are far too lenient with our unremunerative consumers. Gas at present is cheaper than electricity, but the margin in our favour is not as wide as it was. Maybe there is room for improvement in the grilling arrangement of gas cookers. Could we not have a radiant-heated grill embodying the surface combustion principle? Must the deflector plates be as they are? Could they not consist of solid blocks of non-combustible material of a non-metallic nature giving a much more uniform heat?

Sales Policy

For too long the industry has been without a proper sales policy. We are in some respects a house divided against itself. We have not yet made up our minds as to the conditions under which instantaneous water heating is to be preferred to storage heating. Cannot the subject be thrashed out so that for a given set of conditions we may know what is the answer? What the gas industry needs today are salesmen who can talk to the housewife in her own terms. We were all encouraged by the recent advertising campaign. The plumber and the ironmonger are potential allies. In most towns there is only one gas showroom, whereas there are in effect many electricity showrooms and several electricity fitters for every gas fitter. Again, in regard to home service, have we done enough? Are we in a position to give advice on dietetics, invalid cookery, domestic hygiene, and other matters of interest to the housewife? Could we not organise lectures on such subjects as a change from the usual cookery demonstrations? Is it the best policy to send a skilled demonstrator round to investigate each new cooker sold when the work could equallly well be carried out by less highly trained personnel, leaving the demonstrators to concentrate on their job of demonstrating?

In Carmarthen we do not have many opportunities in the industrial field. However, apart from central heating, bread baking, confectionery, and so forth, there are possibilities such as milk-bottle washing, sterilisation, and steam for dairy work. In at least two cases we have sweet factories entirely fuelled by gas. With the development of the grid and the improvement in prices which may be anticipated from such development, I see no reason why substantial increases in consumption cannot be obtained in rural areas.

I believe that the experience of the first five years under nationalisation has shown that the system adopted works well and is acceptable to the industry as a whole, that it has proved advantageous to those engaged in it, and certainly to those who purchase our products. Finally, a word concerning the consultative counils. The conception behind the creation of these councils was sound, and in their personnel we have friends who can perform a vital function—namely, to provide an unbiased liaison with our consumers. Our interests are those of our consumers. In this matter of deciding the relative merits of different policies the consultative councils serve a useful purpose. The local committees of these councils bring the liaison to the local gas manager. I have always found the local committee sympathetic and helpful and should be sorry to see any radical change in the present set-up.

While the amount of fuel used annually in this country for all types of central heating is not accurately known, it certainly amounts to several millions of tons. Low pressure hot water boilers and radiators are most commonly employed. Efficiency of maintenance and operation of the boiler and avoidance of excessive temperature are of high importance having regard to fuel consumption in central heating. A temperature 1°F. in excess of requirements may, for example, result in 5% additional fuel consumed. In many instances members of the staff concerned are employed mainly on other duties and only secondarily as stokers. To meet the needs of establishments employing such men, the Ministry of Fuel and Power has prepared an instruction card, 'Notes on the Operation of Hand-fired Heating and Domestic Hot Water Service Systems.' The notes are, of course, equally applicable to larger plants with full-time stokers. The notes will be supplied mounted on stout card and varnished. Copies are obtainable, price 2s. net, from any branch of H.M. Stationery Office.

MAINS AND SERVICE PRACTICE

FROM A PAPER TO THE WALES AND MONMOUTHSHIRE DISTRICT SECTION OF THE INSTITUTION OF GAS ENGINEERS AT PORTHCAWL, ON MAY 13, 1954, BY

G. FITTON,

B.Sc., M.Inst.Gas E., Engineer and Manager, Neath Undertaking, Wales Gas Board.

Without being in any way derogatory to the smaller undertakings, the advent of bulk supplies from large sources will put into the gasholders of these undertakings a gas of higher standard and of greater consistency than they could possibly have adhered to when they were operating individually. This is especially true where large proportions of carburretted water gas were manufactured to meet peak demands.

Advantages will accrue from gas of more consistent composition, from closer control of calorific value and specific gravity, and from lower oxygen content and dew point.

Effect of Specific Gravity

The effect of a lower and more consistent specific gravity can be of great importance where an undertaking has an overloaded distribution system. When passing a fixed volume, the pressure drop in a main is proportional to the specific gravity. A rise in specific gravity from 0.4 to 0.5 will result in a rise of 25% in the pressure differential from station governor to consumer's meter. This may not be material in a district where mains are of adequate size and where, for example, a works pressure of say 7 in. W.G. suffers a maximum difference of only 2 in. when specific gravity is 0.4. A rise in specific gravity even to 0.5 would only raise the pressure loss to 2.5 in. W.G. and reduce terminal pressure to 4.5 in. W.G. The position in many towns is very different. The Neath undertaking may be quoted as an example, where, as a consequence of peripheral development, works pressures at times of peak demand have been progressively increased to the limit of the installed booster capacity—namely, 18 in. W.G., which, with a specific gravity of 0.45, give a terminal pressure in one direction of the order of 3 in. W.G. A rise of specific gravity to 0.5 will increase the pressure loss of 15 in. W.G. by approximately 10% and reduce the terminal pressure to 1.5 in. W.G. or half its previous value. In practice, of course, the reduction in pressure would reduce availability at and near the terminals, and thus lessen the flow through the mains. The example shows the great influence which specific gravity can have on pressure conditions in mains.

Corrosion

Many of our distribution systems are carrying large accumulated deposits of rust. It is not an uncommon experience that when an undertaking starts to distribute dry gas trouble begins from blockages caused by accumulations of rust. The same thing can arise when undertakings begin to receive bulk supplies, with the result that district conditions can deteriorate instead of improve. Clearance of blockages is certainly not going to be accomplished by poking-down service pipes with a piece of wire and then blowing back into the main with a force pump any rust that remains in the pipe.

Cleaning of Mains

At Neath, to clear rust deposits from steel mains, the practice is to open a section of main and to blow it out with an air stream from the portable compressor used for operation of pneumatic tools. We have found that there is a critical velocity of air-travel along the pipe at which the rust becomes airborne and is blown clear. This critical velocity appears to be of the same order irrespective of the size of pipe, so that the volume of air required is roughly proportional to the cross-sectional area of the pipe. The method has the advantage that the heat of compression tends to dry-out any moisture in the pipe and thus facilitates the blowing-out of the rust.

The length of main cleared at each blow is often governed by the layout of junctions, syphons, etc., and openings are usually arranged to provide for their temporary removal. In deciding the actual lengths to be opened consideration must be paid to the extent of the deposit; but, with 3 in. steel mains carrying rust to a depth of about 1 in., lengths of up to 125 yards have been handled without difficulty. With cast iron mains of similar size, where depths are usually less, up to 200 yards have been blown out in one operation. For re-connection, Johnson couplings are used where the external surface of the main is good enough. In other cases ordinary lead-jointed collars are employed. All cuts and bagholes are, of course, prepared in advance of the cleaning operation itself; and, as the blowing-out of the main is usually completed in about an hour, it is not necessary to interrupt supplies to consumers, including breaking and remaking of joints, for a period of more than four hours. Opportunity is always taken on these occasions to clean all connected services. This is usually done by blowing the rust back into the main with a force pump while the main is open. A final purge with the air compressor removes it from the system.

Estimated costs of cleaning a group of steel mains, laid about 25 years ago, are as follows:—

	£
Labour	107
Materials	27
Reinstatement	52
Use of compressor and sundries	10
	196, or 5s. 4d. per yard

In this example cost per yard is higher than usual, because of the short sections arising from many junctions. Reinstatement is also high in this case, due to openings of the carriageway being necessary at most points.

In some places vacuum machines have been used for the cleaning of mains. It would appear that only the larger units would be capable of attaining and maintaining the necessary velocity of flow to uplift the rust within the main. Costs would be similar, but the dust nuisance—although it has never assumed serious proportions during the Neath operations—would be entirely eliminated.

Cleaning of Services

All the thought and planning of the major projects of the Board and all the sales promotion work and publicity are completely wasted on any consumer who is unable to obtain at all times an adequate supply of gas. Absence of reports from consumers may not be proof of an adequate condition of service. Poor pressure can come to be accepted as normal.

For service clearance, there is no doubt that vacuum machines provide the most practicable and economical means of removing rust. It is equally certain, however, that they cannot be fully effective unless used in conjunction with a flexible steel 'snake'. In recent years there have been several ingenious developments in the accessories available which facilitate their simultaneous use. Attachments are available to enable the flexible snake to be fed into the service pipe at the same time as vacuum is being applied, so that, as the rust is loosened, it is kept moving until it is clear of the pipe. A transparent cyclone enables the operator to see exactly what is being removed and an arrangement of gauges, etc., is available to indicate pressure conditions in the service at varying rates of flow and thus to show the extent of clearance achieved. Care must, of course, always be exercised where there is any possibility of two meters being con-

(Continued on p. 434)

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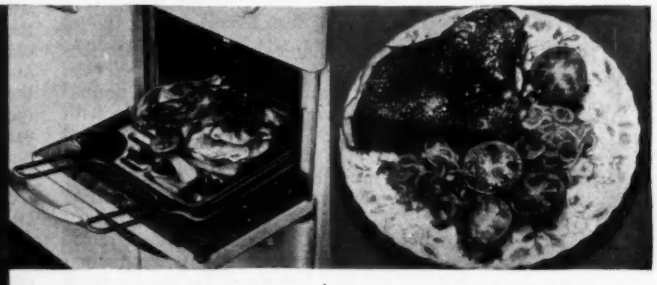

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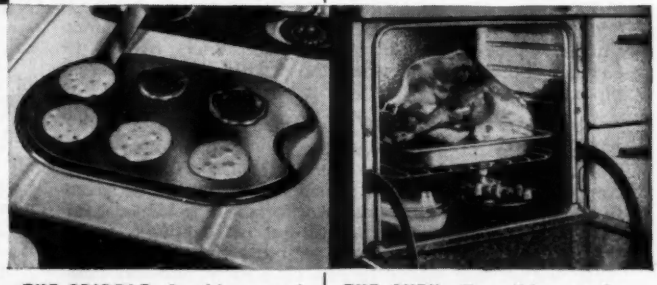

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nected to one service. Vacuum applied to either meter position will damage seriously, if not irreparably, the other connecting meter. It is essential that there should be strict code of practice for mechanical service cleaning operations. If this is followed, damage to meters rarely occurs.

It is our practice at Neath to employ mechanical methods as far as possible subject to our present limitations of mobility. It has been our experience that 80% of the service faults issued to the machine operator are cleared without opening any ground. To obtain the fullest use of such equipment, extreme mobility is fundamental. This can be attained economically only if the unit is mounted on its own prime mover. With mobility the operator of such a unit could also deal with syphon inspection. Complete mobility, combined with proper organisation, can, in fact, be an important factor in speeding-up attention to service faults. It should be possible so to organise operations that they receive the same prompt action as that given to leakages.

It is not easy to compare the cost of mechanical clearing with the traditional method of excavation and cutting-out. The average cost of each opening of ground for service cleaning may be estimated at:—

	£	s.	d.
Labour	1	8	6
Material for reconnection, etc. ..		12	6
Reinstatement		15	0
Sundry		5	0
	£3	1	0

The ascertained costs of mechanical cleaning of services over 12 months amounted to approximately £1 per service. It should not, however, be assumed that overall annual costs of service maintenance would fall in this ratio with the introduction of mechanical equipment. There will remain a proportion where a machine will fail and two charges will arise. One must bear in mind long services inaccessible to wheeled vehicles. In hilly districts these may be numerous.

In Neath approximately 1,000 services have required attention per annum due to corrosion deposits, equivalent to approximately 8.5% of all services. This figure is of the same order as that quoted recently for the North Western Board as a whole (7%). It is important to note the effect of eliminating from the divisor the services supplying post-war houses and those renewed as part of major relaying programmes. Of a total of approximately 11,700 consumers, 1,750 fall within this category and increase the percentage incidence of service faults from 8.5% to 10%. The overall cost of service maintenance similarly rises from £26 per 100 consumers overall to £31 per 100 consumers when those with post-war service pipes are excluded.

Major Relaying Programmes

Many undertakings have sections of their district in which service faults are so frequent and/or incapable of complete rectification that consideration has to be given to extensive relaying. A case can often be made in these circumstances for the expenditure of capital on the grounds of savings in maintenance costs alone. Two such areas within the Neath undertaking have received consideration on these lines in recent years.

The first was a group of streets of terrace property originally fed by single 2-in. cast iron mains laid in the carriage-way. The mains themselves were carrying heavy deposits and the services, especially those crossing the full widths of the streets, were in poor condition. Due to the position of the mains, they involved expensive ground openings each time attention was required. Without delay decision was made in favour of dual mains; and 3-in. cast iron mains were laid in each footpath, with 4-in. approach mains to give adequate mechanical strength to road crossings. As a result, no service pipe is more than 6 ft. in length. Five years have elapsed since the work was carried out, but no maintenance has been necessary, and this can never assume the proportions in extent or difficulty and cost of attention which arose with the old system. When the time comes to renew these services, the cost will be only a fraction of what it would be if the single main system had been repeated.

At the moment the Neath undertaking has a similar scheme involving a group of streets all fed in the same way by single 3-in. mains in the carriage-way near one side. The considerations in this case were slightly different, in that the existing mains are in reasonably sound condition and capable of further service. Due to ground conditions, however, the service pipes were known to be in bad condition; and when examination becomes necessary this usually involves renewal. In half the cases this can involve a road crossing. This, apart from its cost, means putting back into undesirable ground the same amount of material vulnerable to corrosion.

Two factors had, therefore, to be taken into consideration and weighed against the capital costs of a major scheme of renewal:—

(a) Loss of gas due to direct leakage, especially bearing in mind the proximity of the trunk mains carrying high works pressures at times of peak load.

(b) Savings in the cost of maintenance of services both immediate and long term.

In the particular area concerned, on account of the network of short streets and the number of connections to trunk mains, it would have been difficult to measure accurately the direct leakage from the area as a whole. As we knew that conditions were similar throughout, the longest street was selected for test and the main was isolated at each end from other mains and reconnected at one end through a 200 cu.ft. per hour meter. The main was sealed at each end by two bags, the space between the bags being flooded with water. All main cocks were closed and the test was continued for two hours, during an afternoon when pressures are approximately equal to the daily average. Leakage from the system at the rate of between 30 and 40 cu.ft. per hour was recorded on the meter, which is equivalent to at least 250,000 cu.ft. per annum. This street contains approximately one-tenth of the houses in the particular area so that the total leakage from the area was taken to be of the order of 2.5 mill. cu.ft. per annum—or, say, £375 in value.

Maintenance costs have been shown above to be of the order of £31 per 100 consumers. However, in view of the facts that the incidence of service faults in this area is twice the undertaking average, and that rectification here is often costly, we may confidently anticipate savings at the rate of £70 per 100 consumers, or approximately £500 per annum.

A total anticipated annual cost of £875 can, therefore, be offset against capital charges arising from a renewal programme.

Dual or Single Mains

Consideration had then to be given to the old question of single or dual mains. In this case the circumstances differed from the group investigated in 1949 in the following ways:—

(1) The existing mains would be retained. Therefore, all services transferred to the new main would have to be plugged-off on the existing main, which would involve numerous small openings in the carriageway.

(2) Services on the same side as existing mains would be longer than when the main is in the footway.

As a basis of comparison of costs, the longest street (Pendrill Street) was again selected and the following estimates on p. 435 prepared to show the cost of providing a second main in each street, as compared with renewal of all services, half of these involving road crossings:—

(a) Provision of 3-in. main in westerly footpath parallel to existing 3-in. main near kerb on east side of street.

In view of the difference in cost being so small it was recommended that dual mains be provided for the following reasons:—

(1) Minimum steel in unfavourable ground.

(2) Greater ease of cleaning short services (short term saving).

(3) Preservation of goodwill of local authority by keeping disturbance of tarmacadam carriageway to a minimum.

(4) Lower cost of renewal of short services (long term saving).

A scheme was prepared for the whole of the area on

this basis. Mains 3-in. in diameter were provided in the footpaths throughout, the use of 4-in. mains being confined to road crossings and to one line of main right across the section, parallel to the main road. The use of

(See note at foot of p. 434)

		£
Mains:	Material	136
	Labour	135
	Reinstatement	90
	Sundry	10
Services:	Material	15
	Labour	26
	Reinstatement	30
	Sundry	7
		449
10%	Administration	45
		494

(b) Renewal of existing service to houses on west side of street by crossing carriageway for each house.

	£
Material	49
Labour	135
Reinstatement	170
Sundry	30
	384
10% Administration	38
	422

3-in. mains in these positions represented a saving of approximately 10% compared with the use of 4-in. mains.

The costs of the whole scheme have been prepared in detail and total:—

	Capital Expenditure £	Annual Charge £
Mains	4,554	264
Services	2,181	268
		532

Programme for Trunk Mains

The Neath undertaking has recently had to consider its trunk main system and ascertain how best to adapt to eliminate it, the while providing sufficient capacity to meet future development. We were faced with the usual problem that many existing trunk mains are within the congested area of the town centre, where space is restricted both on and in the roads.

The factors prompting the review are:—

(a) The present high pressure absorption as Sunday peak between the works and Cimla area, amounting to approximately 15-in. W.G., a considerable part of which arises in the first 500 yards of main which is only 10-in. dia.

(b) Existing and potential housing development in the Cimla area.

(c) Potential new housing development and scope for extra load in existing houses in Skewen.

(d) The urgent need to eliminate excessively high works pressures, because of their effect on unaccounted-for gas by aggravating direct leakage and by their effect on revenue, due to the metering of compressed gas and because of undesirable and, at present unavoidable, large variations in pressures at appliances in the district generally.

(e) Elimination of erratic supply conditions due to the large variations in terminal pressures, resulting from comparatively small and unpredictable changes in load and in specific gravity.

Theoretical and Practical Assessment

With the Neath section it was necessary to ascertain the flow pattern within the existing mains. Once this was established it would become possible to forecast the effect of changes envisaged, and then to select the most appropriate pattern. The first step was to make a series of pressure surveys along the route of the principal main from the works to Cimla. The average of conditions recorded on several successive Sundays gave an apportionment of the overall pressure loss of 14.4 in. W.G. between the various sections.

A check was made on these observed pressure differentials on a completely theoretical basis. The Neath section was divided into sectors and a fairly close estimate was made of the number of consumers in each sector. The flow of gas into each sector was then deduced, using an arbitrary figure of peak rate demand of 20 cu. ft. per consumer per hour, this figure being based on previously ascertained overall peak average flow of approximately 18 cu. ft. per consumer per hour. By aggregating these flows it was possible to build-up the pattern of the flow along each section of the trunk main. Theoretical calculations of pressure losses in each section were determined and found to be in close general agreement with observed pressures.

Development of the Scheme

The situation, it was considered, could be met by developments on the lines of:—

(a) Installation of high or low pressure storage at the extremities of the district.

(b) Operation of the entire district at high pressures during peak flow, subsequently governing at each service throughout the district.

(c) Modification of the existing low pressure system.

The first method was ruled out because of the high capital cost involved and because of the difficulties envisaged in obtaining the necessary planning consent. In considering the second alternative, it was ascertained that peak pressures of the order of 2 lb. per sq. in. would be necessary to meet the foreseeable load, and in view of the known condition of many mains and services it was considered unwise to subject them to pressures of this order in view of the leakage which would inevitably ensue. It was decided to investigate the possibility of a solution to our problem on the basis of low pressure distribution practice. Because further building in Neath will take place at or near the extremity of the Cimla mains, two possible lines of approach were considered:—

(a) To enlarge the present trunk main along its present route.

(b) To relieve the load on the trunk main by developing ancillary feeds to Llantwit on its north side and to Westernmoor on its south side.

It was decided to adopt a combination of these alternatives and to provide:—

(a) An 18 in. replacement of the 10-in. main causing a bottleneck in Gasworks Road.

(b) An 8 in. auxiliary feeder from the Briton Ferry main to remove from the Cimla mains much of the load of the Westernmoor estates.

(c) Transfer of the present Skewen main to serve the town centre and, by direct connection to other existing mains, take over much of the demand of the Liantwit sector.

Following information about a jet-booster installation constructed by the South Eastern Gas Board, we have considered the application of the principle to our boosting requirements at Neath; and the Neath undertaking is carrying out an experimental installation on a large scale. It is felt that there is a great potential application for this technique in Wales, where so many undertakings are, or will be, taking-in bulk supplies at pressures of up to 20 lb. per sq. in., and, therefore, by utilising the energy of the compressed gas, will be able to effect economies in power costs for the operation of mechanical town boosters.

The booster is arranged to inject a stream or 'jet' of high pressure gas into a low pressure main and thus to impart to it a higher pressure of the mixed gas. This is, of course, simply the familiar principle of the bunsen burner operating on a gas/gas mixture instead of a gas/air mixture. Fundamentally, the governing principle is the conservation of momentum; but, as the specific gravity of the induced flow is the same as that of the inducing flow, a given jet flow will induce a higher ratio than in the case of the induction of air to form a gas/air mixture. The resulting pressure uplift depends, of course, on the

pressure applied to the jet; the orifice size of the jet; and the ratio of inducing to induced flow.

Design of Experimental Unit

In designing the booster unit for the Neath installation, it was necessary to arrange for easy adjustment of the controlling factors. It has been arranged to meter incoming high pressure gas at pressures up to 5 lb. per sq. in. and to restrict the outlet meter pressure as necessary. Control of pressure is obtained by the setting of a surplus pressure valve discharging into the holder inlet mains and designed to hold a predetermined pressure on its inlet.

The orifice of the jet is formed at the apex of a hollow conical iron casting so arranged that different drillings of a series of castings from the same mould give a series of graduated orifices which can be screwed on to the carrier tube. Ample length has been allowed between controlling valves and on flanged pipes to enable substitutions to be readily effected. The experimental unit had to be arranged so that, after the initial installation, all adjustments could be made without any interference with town supplies.

Initial experiments will be based upon an operating pressure of 2 lb. per sq. in. and a jet/induced flow ratio of 1:3. Preliminary calculations indicate that a pressure rise of the order of 2.5 in. W.G. may be expected—*i.e.*, an uplift from a cupped holder pressure of 6.5 in. W.G. to 9 in. W.G. Initially the jet and throat have been arranged to suit these conditions.

A diaphragm type of non-return valve is fitted in parallel to the jet booster and the pressurised mixed gas flows to the town governors where pressures are controlled in the ordinary way. When the induction effect of the jet is insufficient to maintain the necessary pressure, mechanical boosters will be brought into commission. If, on the other hand, at other conditions of load the jet flow itself is more than sufficient to meet town requirements, the jet will be 'bent back' on itself and will discharge into the holder by a reversal of flow through the induced gas connection.

MANAGEMENT TRAINING COURSES

FROM A PAPER TO THE WALES AND MONMOUTHSHIRE DISTRICT SECTION OF THE INSTITUTION OF GAS ENGINEERS ON MAY 13, 1954, BY

H. BUCKLEY,

M.Inst.Gas E., M.Inst.F., Deputy General Manager and Engineer, Pontypool Undertaking, Wales Gas Board.

A significant phenomenon of the present time is the growing interest among leading industrialists and British business men in training for senior managerial positions. A measure of the interest now being taken in the subject can be gauged by the fact that in 1951 this country sent a team of men eminent in this particular sphere to report on education for management in the United States. The team, in its findings, does not state that it found American management any better or more enlightened than British management, but, what is probably intended as a mild censure on British management is included in conclusion 14 where the team states: 'American experience has shown that productivity and education for management are closely related. The subject is of such vital importance to Britain that industry as a whole should study means for promoting educational experiments for executive development . . . and educational authorities should consider how they can best encourage and develop administrative studies.'

If we accept the conclusion that productivity and education for management are closely related and that there is a need for British industry as a whole to promote schemes of training for management, we are left with two problems. The first of these problems is, Can management be taught? The second is, If it can be taught, what is the best method to use? Before discussing whether management can be taught it will be as well to understand clearly what we mean by management. Books galore have been written on management, many unfortunately by educationalists with little or no administrative or industrial experience. They have taken chapters to define management, so in attempting a short definition it should be appreciated that a more explicit definition could be given at greater length. It is suggested that the task of management at any level is 'the control of group effort'.

Technique of Budgetary Control

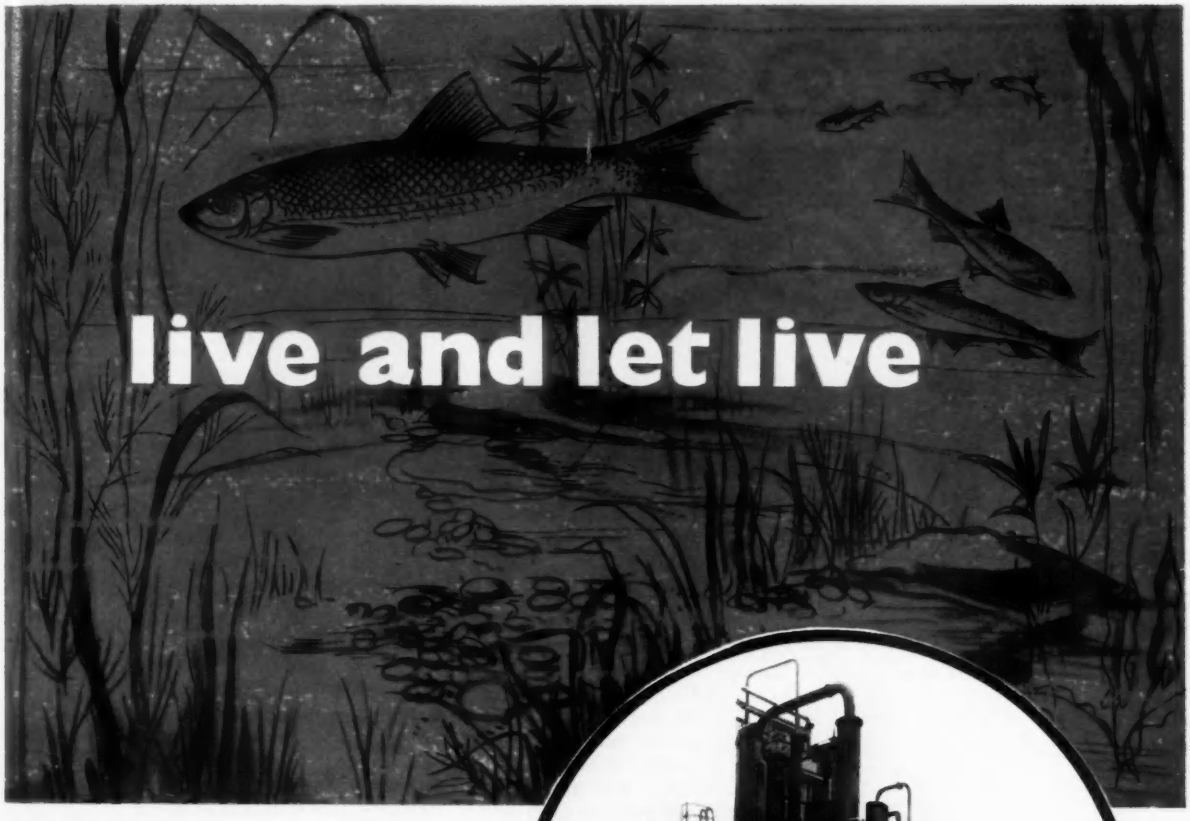
In executing the task of management certain techniques such as budgetary control, costing, purchasing, co-ordinating, engineering techniques and methods, as well as industrial relations, are employed; and a man must master these to become a successful manager. Many hold that managers are born and not made but few will deny that the techniques enumerated can be taught. What is not quite so certain is whether skill in the use of these techniques can be taught. The need of industry in making managers is to take men with various skills, technical and otherwise, and develop them in such a way that these skills and other techniques learnt can be applied in a practical field with a team of people.

In deciding if management can be taught, it is first necessary to consider what is required to be taught. The manager should have personality, moral character, tact, drive, initiative, as well as powers of planning, organising, staffing, directing, co-ordinating, reporting, and budgeting. The first five qualities enumerated—by no means a complete list—might be termed the abstract qualities and it could be argued that these are inborn and cannot be taught, while the other items listed, being techniques, can be taught. The extent to which the abstract qualities will be developed in any man will depend largely on the environment in which he has been brought up and worked. While these qualities are most desirable, they are the most difficult to cultivate, and one can hardly envisage their development of the training for management is to be by correspondence courses, which, it is understood, are employed in the United States.

Education for Management

Facilities for acquiring a knowledge of management subjects by study and attendance at courses was very limited before the war. Certain professional qualifications imparted a knowledge of some aspects of the field. For example, accountancy qualifications largely covered the financial side, while the National Certificate in Commerce as conducted at certain technical colleges had a limited management content. At least two professional engineering institutions recognised the need, and established examinations in the principles or fundamentals of industrial administration in their qualifying examinations. The first courses in general management were sponsored in 1927 by the Institute of Industrial Administration. The Manchester College of Technology established a one-year post-graduate course in industrial administration in 1927-28, while the University of London began a full-time one-year course in 1931. The war naturally curtailed development, but a new and greater interest was apparent after the war. In 1947 a committee under the chairmanship of Lt.-Colonel Urwick reported to the Ministry of Education on action that could be taken to co-ordinate the requirements in the field of management training. The committee recommended a national scheme of management studies to consist of an intermediate and final stage. The committee's recommendations were accepted and a course was planned which took three years' part-time study to reach the intermediate stage and a further two years to reach the final stage. Administration of the scheme was arranged jointly by the Ministry of Education and the British Institute of Management.

(*To be continued*)



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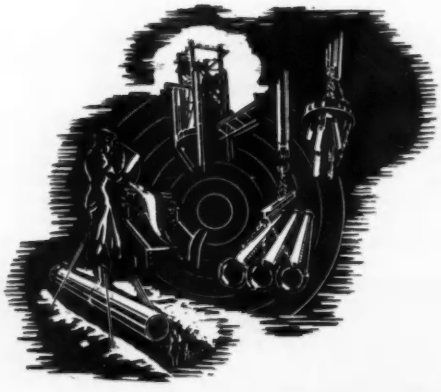

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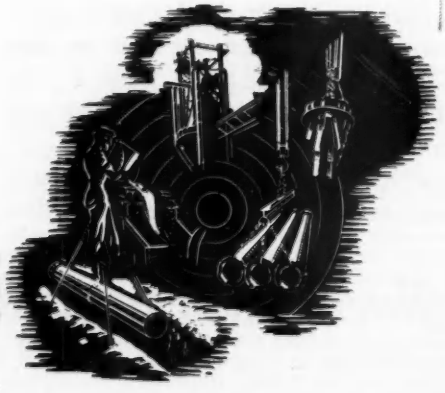

THE STANTON IRONWORKS COMPANY LIMITED NR. NOTTINGHAM

GRID INTERLINKAGE

The following is a continuation of our report of the paper given by Mr. C. Summersgill to the Manchester District Junior Association of Gas Engineers (from p. 370, 'GAS JOURNAL,' of May 12), together with our report of the discussion.

As the loads develop and more gas has to be returned from storage than can be handled at holder pressures, a fan booster will be installed as shown in Fig. 2. This will be automatically started when the pressure at a selected point on the main falls below a predetermined level, or when the flow back along the main exceeds a predetermined volume. When the pressure rises or flow falls, the booster will be stopped automatically.

This method described is limited to terminal legs on a grid main; but Fig. 3, showing part of the North Cheshire grid, indicates how it can be applied to an intermediate station. In this case, volumetric governor A is set to pass the total average hourly requirements of the three undertakings, New Mills, Hayfield, and Chapel Whaley. The supplies to Hayfield and Chapel Whaley are also controlled volumetrically, and the remaining gas passes through district governors into the low pressure system of the New Mills undertaking, or, through an excess pressure governor, into the New Mills holders. The excess pressure governor is adjusted to ensure that the pressure on the grid is adequate to maintain 1 lb. per sq. in. at the terminal point Chapel Whaley. This method of reinforcement is suitable for small remote localities through which the grid main passes; but the amount of reinforcement is obviously limited to the average hourly requirement of the undertaking receiving the excess gas —in this case, New Mills.

Although the placing of the volumetric governor on the district gives good flow conditions on the grid, it is not always economic when the volume of gas to reinforce

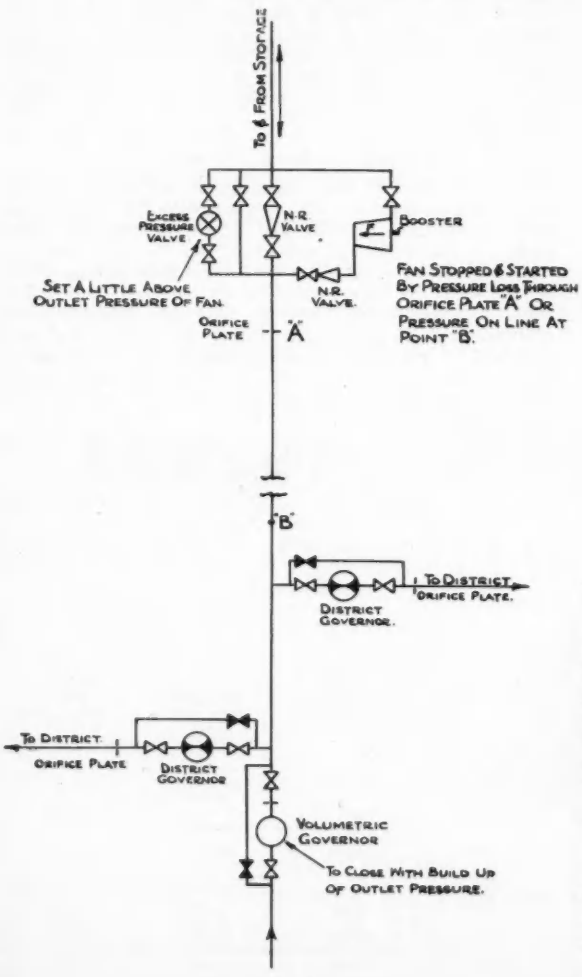

Fig. 2.

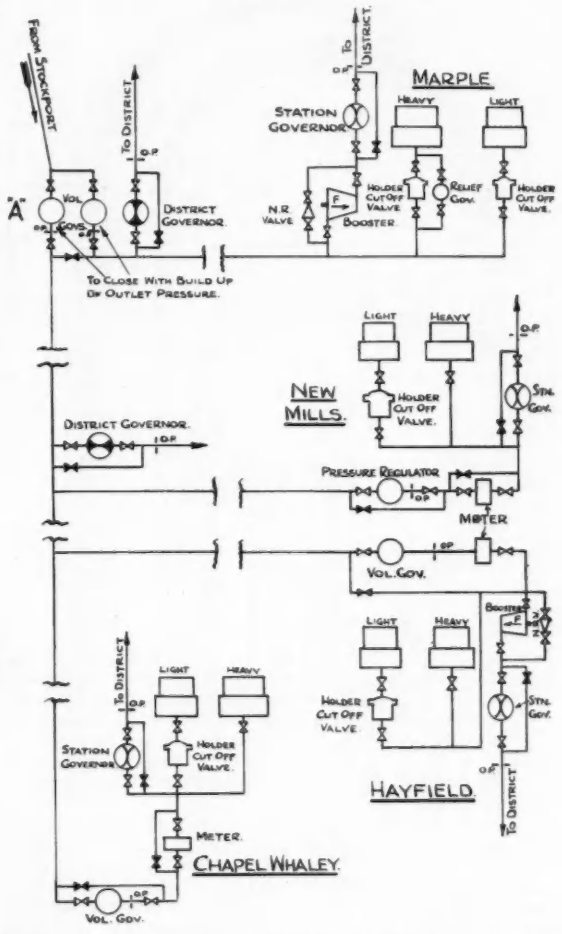

Fig. 3.—North Cheshire Grid: Marples, New Mills, Hayfield, and Chapel Whaley.

the district is small compared with the total volume of gas handled by the grid. The annual charges on capital of a building on the district compared with using an existing building on a works to be closed down, plus the ancillary costs of travelling time for maintenance, inspection, chart changing, and adjusting the volumetric governor if not remotely controlled, or additional cost of transmitter equipment if remotely controlled, sometimes more than outweigh the additional compression cost of putting the peak load directly on to the grid.

Peak loading can also be offset by reducing the intake to the holders during peak demand periods by an amount approximately equal to the volume of gas going out on the district. If the main peaks are levelled off, the resultant effect on costs of the peak load may be negligible compared with other methods of reinforcement.

If it is not possible to counteract the effect of a peak load in any of the ways described above, the cost of

feeding off the grid should be compared with the cost of reinforcing the district by alternative means.

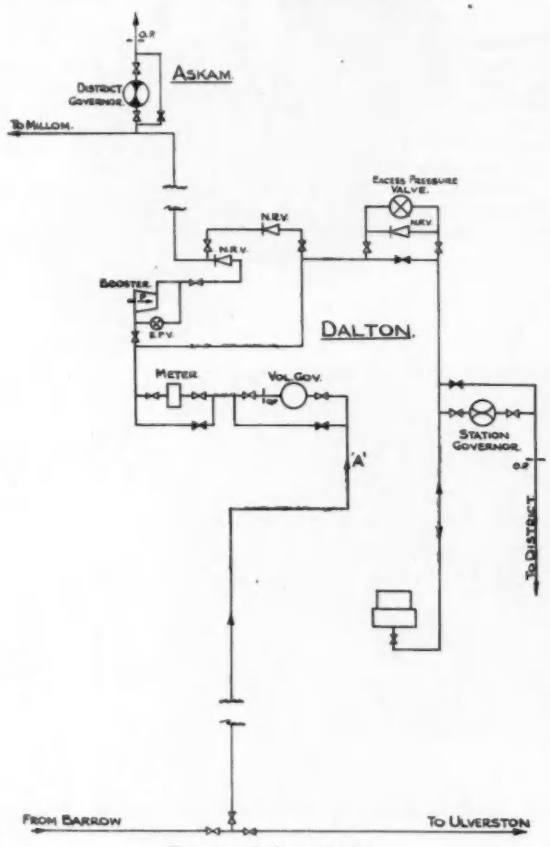

Fig. 4.—Dalton Station.

District Storage

When the reinforcement volume is large, and the district is isolated, consideration must be given as to whether it is better to provide local storage rather than carry the peak on the grid. With daily volumes requiring storage of less than 1 mill. cu.ft. it should always be borne in mind that the capital cost of such storage is far greater than the capital cost of a similar volume expressed as part of a larger holder.

This can best be illustrated by taking an actual example. Part of the overspill from Salford is to be housed in the Little Hulton district, which is at present supplied through a district holder of 120,000 cu.ft. capacity and of limited life. This holder is fed from Partington gasworks through the Lancashire grid. It is estimated that the maximum daily demand in that district will be 1.3 mill. cu.ft. by 1965, and the peak hourly demand nearly 200,000 cu.ft. per hour. The existing holder is completely inadequate for such loads, and in due course other means will have to be found for supplying this new demand.

There are four ways of meeting this:—

(i) By installing two new ½ mill. cu.ft. holders at Little Hulton taking an average hourly supply from the grid.

(ii) By installing one new 1 mill. cu.ft. capacity holder at Little Hulton, and assuming that any repairs that may be needed in the future could be carried out in the summer months when the peak loads would be met direct from the grid.

(iii) By adding the load directly on the grid, the peak loads being carried by storage at Partington. This would require higher initial pressures (at peak periods up to 50% higher) and additional compression plant at Partington, because of the increased volume of gas to be handled and the greatly increased pressures. Compression efficiencies at off-peak periods would also suffer.

(iv) By adding the load directly to the grid, but by closing down the intake at Bolton or some other large station, for four hours per day at peak periods, and delivering into that station the daily gas requirements over the remaining 20 hours. Additional storage would have to be allowed for at Bolton but the load on the grid would be kept fairly constant.

The variable costs are shown in Table 4, from which it will be seen that it is cheaper to carry the load on the grid and to cut back at some neighbouring undertaking at peak periods. There is, of course, one great disadvantage to such a method—in the event of a breakdown on the grid, consumers are directly affected, and with a large peak volume it becomes more difficult to provide an adequate back feed.

The figures in Table 4 illustrate the high cost of small holders (case b), and show how uneconomic it can prove to place large peak loads directly on the grid (case c). In the case of Little Hulton the volume of gas required is 9.3% of the total gas supplied by the grid on a maximum day.

Supply to Rural Communities

Consideration of the economics of supplying any new consumers on the route of the main should be approached in a similar manner. Regard should be paid to capital costs per consumer for supplies from the grid into consumers' premises. In this case peak loads will be placed on the grid, but the average hourly rate into the stations would normally be constant, although this could be reduced at peak periods, providing the holder storage is sufficient. Unless a main is carrying its maximum economic volume or is undersized, a small peak load should be welcome, since it will increase the total running costs but decrease the cost per 1,000 cu.ft. It is possible to calculate by similar methods the maximum peak volume which can be applied without detriment to costs.

To arrive at the effect of peak loads, general rules cannot be applied. The only method to approach this problem is to cost out each case individually.

Co-ordination of production and distribution is essential for grid working. The week-to-week, month-to-

(*Concluded on p. 440*)

TABLE 4

Scheme	(*a*) Storage at Little Hulton	(*b*) Storage at Little Hulton	(*c*) Storage at Partington	(*d*) Storage at Bolton
Maximum initial pressure at Partington, lb. per sq. in.	9.3	9.3	14.38	10.17
Capital Costs	£	£	£	£
1 mill. holder at Little Hulton	85,000	—	—	—
2—½ mill. holders at Little Hulton	—	120,000	—	—
Extra 1 mill. storage at Partington	—	—	58,000	—
Extra 1 mill. storage at Bolton	—	—	—	58,000
Additional compression plant at Partington	—	—	44,500	3,500
Total capital costs £	85,000	120,000	102,500	61,500
	£	£	£	£
Running Costs	£	£	£	£
Annual charges on holders, at 5.42%	4,607	6,504	3,144	3,144
Annual charges on compression plant, at 9.78%	—	—	4,352	342
Compression costs	19,464	19,464	21,582	19,951
Total running costs £	24,071	25,968	29,078	23,437

N.B.—The holder costs include for foundations, and in the cases of Partington and Bolton the cost has been taken as one-third the cost of a 3 mill.-holder.

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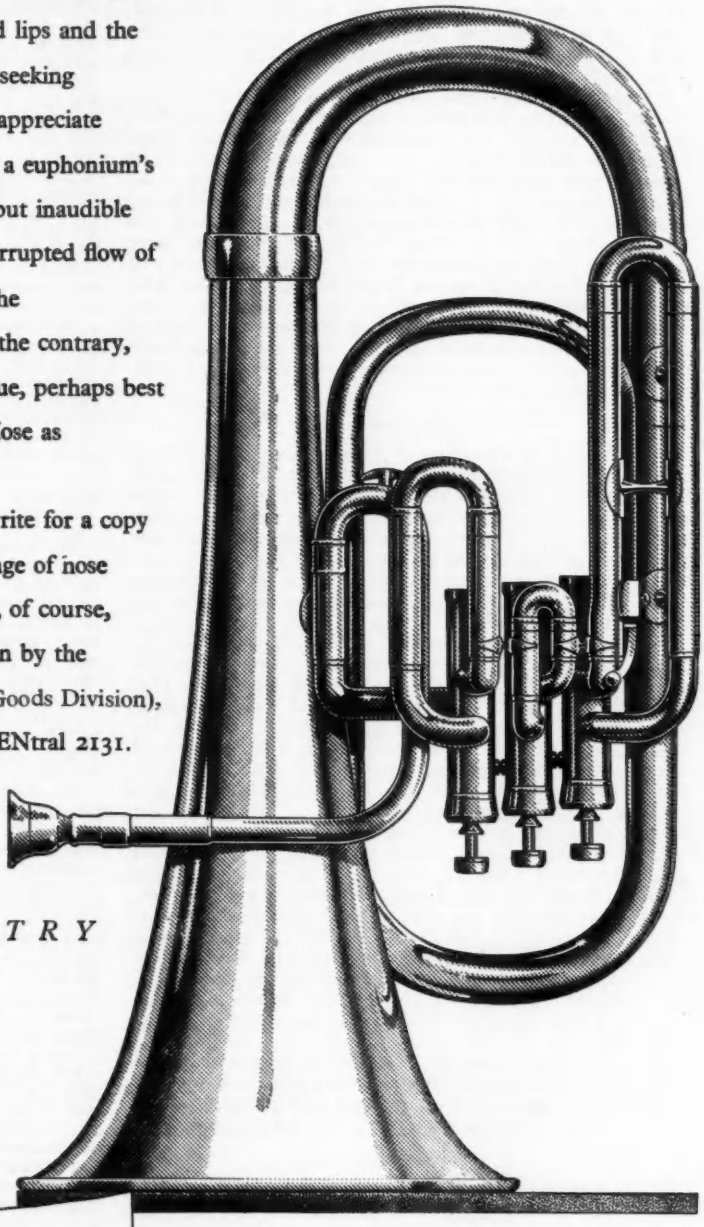
Those who want to know the score should write for a copy of the brochure wherein is illustrated the range of hose available for every industrial purpose. And, of course, technical assistance is also always gladly given by the Dunlop Rubber Co., Ltd. (General Rubber Goods Division), Cambridge Street, Manchester, 1. Tel.: CENtral 2131.



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month and year-to-year running of the grid has to be carefully planned in advance. The long-term estimates will be for a forward period of 10 years, so that plans can be made to have adequate production and storage capacity available. These estimates should be reviewed annually. Shorter-term estimates, which will be more accurate, will be required for two to three years ahead, so that re-setting and other major repair programmes can be carried out on the production units; similarly, repairs to holders which may cause temporary variations in the rate of intake from the grid must also be studied. This planning of repairs is important not only to ensure that gas is available, but because it is through such planning that one of the advantages of interlinkage is to be obtained—namely, the carrying-out of repairs on large units, the load being met by other stations connected to the grid, thereby reducing the amount of standby plant to cover such repair periods.

Careful estimates should also be prepared for 12 months ahead. Decisions will have to be made as to the plants in which the gas is to be produced, and approximate dates fixed for the starting-up or letting-down of individual units. These estimates will be based on past demands, combined with up-to-date information regarding trends in gas sales; they will be on a weekly basis, and will be adjusted from time to time if necessary. From these figures the daily demands will be prepared at least one week in advance. It is on these figures that the grid controller will work. He will know which units are to make the gas, and, if sudden variations occur due to unforeseen circumstances such as unusual temperature conditions, which plant is to increase or decrease its output, start up or close down.

Boosters

Where there is a medium or high pressure feeder main out of a station which is to receive a bulk supply, it is often possible to make use of the grid pressure to feed this district, and so do away with the need for compression plant except for standby purposes. Except in the case of a terminal station, there should be no need to increase the initial grid pressures. If it is found grid pressures have to be increased, it will usually be cheaper to recompress at the station.

Fig. 4 shows how a booster is required at Dalton to ensure a supply into Askam with grid failure. The diagram shows the layout of the Dalton holder station. This works was closed in 1953, but prior to vesting date it bulk-supplied the small gasworks at Askam, where the holders were derelict. The peak hourly requirements of Askam are less than the average hourly demand of Dalton and Askam together, and full use is made of the grid pressure to supply the Askam district. To avoid any adverse effect on grid working, the pressure in the grid main at point A should always be above the pressure at which the excess pressure valve is set to open; allowance is made for pressure loss through the volumetric governor.

Although boosters are not an item directly connected with a bulk supply, opportunity should be taken, when re-organising the station, to install boosting plant, where a fair proportion of the storage throws less than 6 in. W.G. pressure. This may take the form of boosting from light to heavy holders or directly up to the station governors.

Table 5 will give some idea of the comparative capital values of gasholders and boosting-up to station governors, and shows the small cost of bringing valuable capital into full use. It is assumed the volume of storage is equivalent to the send-out for two hours at the peak hourly rate.

TABLE 5

Volume of storage, 1,000 cu. ft.	Capital cost of storage (including foundations)	Booster capacity 1,000 cu. ft.	Capital cost of booster installation (excluding housing)
100	£20,000	50	£1,150
250	£32,000	125	£1,500
500	£60,000	250	£1,820
750	£74,000	375	£2,320
1,000	£85,000	500	£2,800

Holder protection is essential and comparatively inexpensive. The purpose of this feature is to prevent holder collapse by vacuum. This will consist of a tripping device on the holder, or a pressure-operated switch cutting-off the fuel supply to the prime mover of a fan, or a governor between the inlet and outlet of positive displacement compressors to open when the inlet pressure falls below a set minimum.

DISCUSSION

Mr. F. Bell (Liverpool) emphasised the advantage of fixing volumetric governors at the periphery of the undertaking controlling the gas in the grid so that the gas in the mains between the governors and the works could be used for district reinforcement. On the question of remote control, the author had spoken of capital costs averaging from £7,000 to £8,000 per station when buildings, electric wiring, control room, and all ancillary services were allowed for. The type of installation referred to, however, would replace a shift man on a 24-hour rotation. He knew one case of a works sending out 400 mill. cu.ft. per annum, and another of 1,100 mill., where the change-over to remote control had saved the services of one man per shift.

The industry paid for something like 1,366 shifts per annum, although the men only worked some 1,075, because allowances had to be made for holidays and other items. He (the speaker) was of the opinion that it was sound economy to put in a remote control system estimated to cost £7,500. The question of economic size of new mains was of great importance and demanded careful attention to detail. His own preference was for larger mains and lower pumping pressures, rather than to put in smaller mains now and have to go up to higher pressures later on—or, alternatively, to have to lay new mains because of lack of foresight today.

Mr. Summersgill agreed with Mr. Bell that it was important to consider the terminal legs of any grid system to see whether they could use them for reinforcing on the district. On the question of remote control, it was possible to cut down the capital cost, but it was not worth while to cut down to the extent of sacrificing the facilities which would have to be knocked out. Wherever a remote control system could dispense with a shift man it was well worth while, but if they were considering costs in circumstances where a shift system was not involved, the advantages were more difficult to assess.

Assessing the Load

The President (Mr. J. Oates) said it had been his duty to assess new loads, and he would like to have Mr. Summersgill's opinion on one or two aspects. It was his own opinion, based on experience, that it was dangerous to ask an industrial consumer what he felt about his load, and just leave it at that. Would the author agree with him that it was important that an industrial engineer should go to the consumer and assist him to work out his requirements? Secondly, he had mentioned the relationship between the industrial and the domestic load. He asked whether the author would agree that the matter should be approached more from the point of view of local conditions rather than that of a group of consumers or that of a national figure?

Mr. Summersgill said that in estimating any load he would not suggest that anybody could just sit in the office and work it out. It was a matter for the industrial engineer, and the only way was for the industrial engineer to visit each industrial consumer and ask him, not what he was going to use gas for, but what he *could* use it for. The industrial engineer should know, from his experience of relative costs, whether a prospective load was likely to be mutually satisfactory. In the case of a domestic load the sales and service officer must be consulted, and it was important to study the prospects of whether a neighbourhood was likely to continue to be prosperous or was likely to decline.

Mr. L. S. Crowle (Manchester) said that the spending of money on running an efficient maintenance system was in fact a saving on compression costs on the grid itself. He associated himself with Mr. Bell on the necessity for care in fixing the size of new mains. Personally, he thought it preferable to err on the large side. In the early days of gas supply many undertakings laid extremely large pipes. They laid them not because of any magical foresight but because they had not at that time conceived the idea of distributing gas at high pressures. Notwithstanding the rise in gas consumptions those mains had taken the increased load, and although some of them were from 80 to 100 years old they were still workable. In certain instances it would be impossible to replace those mains today or to lay mains of the same size. He suggested that instead of taking a maximum hour as 1/24th of a maximum day they should take a figure of something of the order of 1/18th, and make arrangements so that in the case of a breakdown they could have their holder full ready for the next peak consumption.

Mr. Summersgill explained that he had tried to show that, where there was some doubt about future loads, there was

need for greater care in fixing the diameter of the mains. He did not think it was very important whether they took the maximum hour as 1/24th of the maximum day, or the more common figure of 1/20th.

Mr. H. Partington (North Cheshire) suggested that there was a case for the installation of pressure valves at the terminal stations instead of the more usual volumetric governors. He wondered what the author felt about installing pressure valves at the receiving end. He thought these would enable them to overcome peak periods without boosting.

Mr. Summersgill replied that on a normal grid system it would be dangerous to follow the suggestion put forward by Mr. Partington.

Mr. F. Littler (Deputy Chief Technical and Planning Officer, N.W.G.B.) urged the need for liaison with housing authorities in regard to the laying of mains. They could not afford to put in, say, an 8-in. main if a 12-in. main was necessary. Also, they must try to assess potential loads by means of the closest possible liaison with everybody concerned.

A vote of thanks was accorded to Mr. Summersgill on the proposition of **Mr. A. H. Barrington** (Senior Vice-President), seconded by **Mr. L. S. Crowle.**

THOUGHTS ON EFFECTIVE MAN-POWER

PRESIDENTIAL ADDRESS TO THE YORKSHIRE JUNIOR GAS ASSOCIATION, MAY 5, 1954, BY

A. COLE,

M.Inst.Gas E., A.M.Inst.Fuel, Spenborough, North Eastern Gas Board.

This session the Yorkshire Junior Gas Association celebrates its Jubilee. This 50 years of service that our Association has rendered to the gas industry directly, and to the public indirectly, is perhaps small compared with the 150 years of conscientious service that the industry as a whole has given. Our Association has, however, at all times endeavoured to assist in finding a solution to the many problems, technical and otherwise, with which the industry has been faced. The Association has also played no small part in the sphere of education, since the information on so many technical problems garnered by a few has been disseminated at our meetings to the benefit of all.

Our predecessors, by wise leadership coupled with engineering knowledge, have built the gas industry until today it ranks as one of the premier suppliers of heat; and as a whole it is among the ten greatest in the country. Perhaps because we have been long established we seldom receive the publicity accorded to some of the country's more spectacular and younger industries. Our expansion, nevertheless, has been steady and constant.

Typical of the industry's expansion as a whole is that of the Moorend gasworks, Spenborough. Industrialists in particular have demanded a fuel supply which can readily be controlled in all heat processes. Again the figures at Spenborough can be quoted as typical of the trend of events. Between the years 1921 and 1954 industrial gas sales increased from 80 mill. cu.ft. to 470 mill. cu.ft. per annum, despite the redundancy of the gas engine as a source of motive power.

The keystone of any successful industrial nation is the fuel and power industries. And the cost of fuel and power used must be related to the cost of the final manufactured article. The industrial revolution of the 19th century was due to the abundance of coal in Great Britain. During the last few years the gas industry, in common with other fuel industries, has experienced inflation. The price of gas has continued to increase, despite all efforts to the contrary, and the trend is still upward, due to ever increasing coal charges, the latest of which was applied only on May 3. Alas, the gas industry has been persistently penalised out of proportion to other coal users. The pithead increase to the gas industry on May 3, 1954, is 3s. per ton; and to the electricity industry 1s. 5d. per ton. This discrimination has been referred to by Mr. G. E. Currer (1).

Cessation of gas supplies on a national scale has never occurred. The price of our product has been kept at a minimum, despite the upward spiral of raw material charges. However, the question of price of gas is to the forefront; and I propose to direct attention to this problem.

Table I shows the relative cost of gas and coal during the past four years.

In considering these price increases other factors should also be allowed for in the four years under consideration.

(i) Labour costs have increased by 27.2%.

(ii) Immense further plant expansion of the industry occurred after the war and immediate post-war years. The incidence of capital charges to pay for this expansion, therefore, increased far more rapidly than ever before. H. Johnston states that the total capital charges involved in supplying one new house with a reasonable quantity of gas is 5.78d. per therm (2).

Taking all these factors into consideration I maintain that the increases in cost of labour, coal, and other raw materials have not been passed in their entirety to the consumer by increases in the price of gas—an impressive measure of the ever-increasing efficiency of the industry. This increased efficiency is due to two main factors: Increased technical knowledge; and integration resulting from nationalisation.

TABLE I

Year ending	National Average Selling Price per therm of gas, pence	% Increase over previous year	Cost of coal to the Gas Industry per ton	% Increase over previous year
March 31, 1950 ..	12.155		63s. 3d.	
March 31, 1951 ..	13.00	3.6%	65s. 6d.	3.6%
March 31, 1952 ..	14.09	8.4%	72s. 3d.	10.3%
March 31, 1953 ..	15.59	10.6%	79s. 3d.	9.7%
Overall increase in four years	3.04	24.2%	16s. 0d.	25.3%

During the past five years, integration has been the greatest single factor in minimising gas price increases. But what of gas prices in the future? Further economies by integration cannot continue indefinitely. It is probable that we have already obtained the greater part of such economies. It is certain that gas-making plant of existing pattern will endure at least 15 years. If research on complete gasification was to produce an ideal unit tomorrow, the introduction of the process must inevitably be slow.

Supplies of natural gas could give a reduction in the overall price of gas. Search for natural gas will take a long time (3). Present results, although promising, do not indicate that there exist natural gas supplies in this country sufficient to touch more than the fringe of our requirements, bearing in mind that the gas industry carbonises 27 mill. tons of coal per annum.

With raw coal we can still compete more than favourably for most process work in industry. Although gas per therm of useful heat is greater in cost than raw coal, the product is better due to better heat control, abolishment of filth, and reduced labour costs. In those processes where we fail to compete with coal we can offer coke, particularly with the new down-jet producer (4).

Competition from Oil

The gas industry must face ever increasing competition from oil; and it is with oil that gas prices are most likely to evidence the greatest disparity. Crude oil production is rising constantly throughout the world. What is likely to happen if Persia and Abadan commence production again, as seems likely? Already there is a world overproduction of heavy oil, and the disposal of this heavy oil presents a major problem to all the oil companies. The present price of heavy oil is 10¼d. per gal., falling according to quantity purchased down to 9¼d. per gal. At 1.8d. to 1.9 therms per gal. this represents less than

6d. per therm. Admittedly, utilisation efficiency is not as good as gas, and difficulties of usage are greater, but these problems can be overcome.

One of the difficulties of any large organisation is that the individual tends to be lost. When a man senses this he is, in fact, lost, and his value to the industry and community is correspondingly diminished. And the ultimate operation of all the plant and equipment rests with the technicians. Consequently, I make no excuse for directing attention to three cardinal points which are acknowledged policy and which are the direct responsibility of the technicians in the industry. To a great extent the price of gas depends on these three points.

Efficiency of Gas Production

The Fuel Expenditure Index in the North Eastern Gas Board (5) is as follows:—1950-51, 24.0; 1951-52, 23.8; 1952-53, 22.76.

In 1952-53 the thermal input of raw coal in the North Eastern Gas Board's area was utilised at the gasworks, an efficiency of 77.24%, to produce refined fuels.

Comparing this efficiency with the 15% to 20% efficiency of the open domestic coal fire, with 30% to 35% efficiency of a modern electricity generating station, or even with the 55% to 65% efficiency of a Lancashire boiler steam-raising unit, the figure appears satisfactory. In fact an efficiency of this order is the gas industry's basis for the proud claim that carbonisation is the best way to treat the coal reserves of the country.

In theory the carbonising process can operate at 84% to 86% efficiency, depending on prime power sources and the amount of steam used for boosting gas—*i.e.*, a Fuel Expenditure Index of 14 to 16. In practice it is doubtful if any works could achieve such a low figure, bearing in mind the fuel used for heating-up retort benches. But there is no reason why an F.E.I. of 18 to 20 should not be normal practice in all works of 2 mill. cu.ft. per day capacity and over, providing meticulous control of the retort house is maintained. It has become fashionable to decry the saying that 'profits are made in the retort house.' This statement is not, of course, the whole story; but any works that fails to yield good carbonising results will obviously fail to have a low cost of gas into holder. I submit, therefore, that any works other than the very small with an F.E.I. greater than 20 offers scope for improvement by attention to detail. Any improvement will materially assist the balance-sheet.

If, for example, at a medium sized district such as Spenborough it was possible to obtain a small added yield of 1 therm of gas per ton of coal carbonised (maintaining coke yields constant), there would be an added item on the credit side of the balance-sheet of £2,250.

Improved Output of Gas

The tendency during the past year throughout the country has been towards a slight decrease in output of gas. This has a direct bearing on overhead charges. We must sell more gas—and we must sell the maximum quantity of off-peak gas. This is an uphill road. Modern gas appliances are very efficient. A modern cooker needs only three-fifths of the gas required by a cooker of 30 years ago, and since nine out of every ten households in the country use gas for cooking, the sale of a new cooker in lieu of an old may well result in a reduced gas consumption. Water heating and refrigeration probably present the most fertile domestic field for added loads.

In industry, however, the efficiency and simplicity of control given by gas for all heat-treatment processes are outstanding. The vigour with which industrial sales are pursued will probably affect output more appreciably than any other single factor. Moreover, the industrial load is not subject to excessive peaks. During the 1930 slump period the sale of any gas appliance was almost a major achievement. The keenness exhibited during that difficult period by our sales and distribution staff must be utilised again.

Greater Productivity per Man

An important contribution to the reduction of cost of gas into holder may be achieved by improved output of work per man employed. Trades unions, managements, and individuals in all industries pledge themselves to the aim of greater productivity. Yet, in nearly every industry output per man has decreased during the past 10 years. Total industrial output has increased (White Paper (6), but this is due to increased mechanisation and greater horse-power available to each individual employed in industry. Output per man in the gas industry has tended to fall, particularly in the hard manual jobs. Before 1939 the standard method for years for obtaining work output from a man was based on the man's own knowledge that if he did not do his job either in quality or quantity there were always other men available at the Labour Exchange. What a criticism of pre-1939 civilisation! And the gas industry was among the best of employers with never any lack of entrants. It offered good wages with security. Nobody desires a return to conditions under which unemployment created psychological fear. For 15 years that state of affairs has ceased to exist. Is there cause for assuming that the pendulum has swung too much in the opposite direction?

The Element of Leadership

We have been exhorted to produce more. It is difficult for a man digging a trench for a gas pipe or emptying a purifier box to feel wildly enthusiastic about such an appeal. Few men, however, will fail to respond to good leadership. It is in good leadership, accompanied by effective partnership and reasonable financial incentive, that hope lies for increasing output per man. A slow method, maybe; but I am convinced it is the only way to imbue a feeling of pride in a man's work and a feeling of loyalty to his industry. There is nothing new in this. In the gas industry, despite a constant proportion of labour turnover, a solid core exists of men in all grades who do carry out their work quietly and efficiently without major supervision. No board or group of senior officials can hope to contact personally upwards of 10,000 employees. The responsibility for this leadership lies fairly and squarely with those technicians directly in contact with the men. Every employee is entitled to be treated as an individual, not as a mere unit. In almost every industry conditions of employment and rates of pay are determined by national agreement. Such agreements are cold and impersonal. They are the skeleton on which we, the engineers and technicians, together with the trade union leaders, must put warm living flesh.

In all spheres of life there is a recurring pattern of 'crises.' Today, the gas industry must overcome the price obstacle. Much of the onus for action to effect this rests with the technicians of the industry, of which our Association is a representative body.

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(6) Economic Survey, 1954. White Paper.

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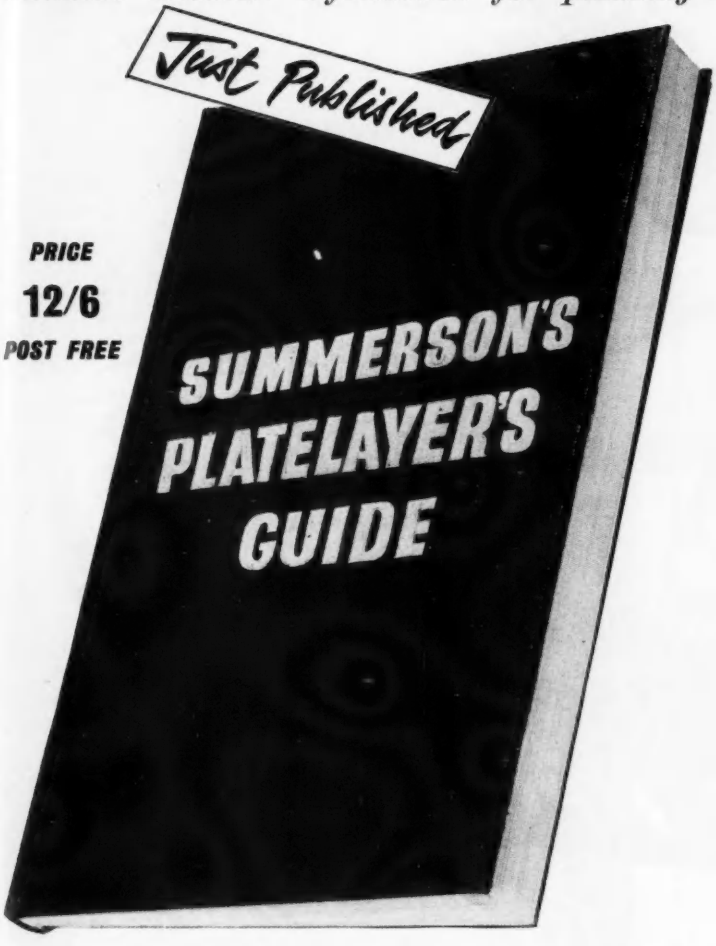

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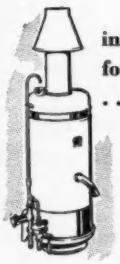

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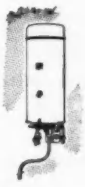

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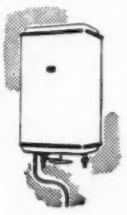

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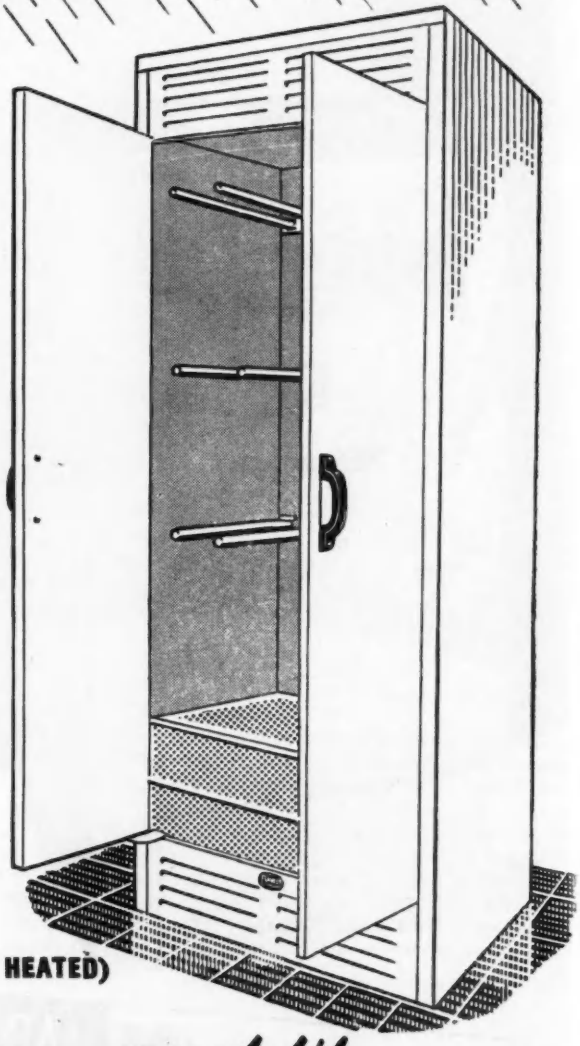

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Budgetary Control and the General Manager

FROM A PAPER AT A CONFERENCE OF ACCOUNTANTS OF THE SOUTHERN GAS BOARD BY

J. C. HOGG,

M.Inst.Gas E., General Manager, Bournemouth Group, Southern Gas Board.

In the early stage of budgetary control at Bournemouth I sensed an attitude of wariness to the system. Adoption of such a system in an industry which has so many complex inter-relationships, where measurement difficulties of all kinds exist, and where standards range from the exact via the arbitrary to the non-existent, seemed a formidable project. On the other hand, here was an instrument of management which, if it could be constructed and calibrated to suit our conditions, appeared to have most rewarding features. The fact that new ground would be broken added to the interest, and constituted something of a challenge to the Bournemouth Group.

Education

In this first phase of progress was contained not only the study of the principles of budgetary control and the flexible budget, but the examination of all the many operations which were carried out throughout the undertaking. The production side of the Bournemouth unit was tackled first, and that was followed by distribution workshops and certain sections of the district and distribution work.

Education, with some exceptions, was taken as far as superintendent level or its equivalent. It was felt that it should be retained broadly at works superintendent level because there was so much which was in doubt at that time, and which called for discussions and investigations. To have taken it further would have served little purpose in developing confidence in the system.

It must be remembered, though, that even at that stage various people, including foremen and inspectors from the appropriate departments, were consulted when formulating the various standards—an important point in stressing that technical standards were to emanate from those in a department rather than be imposed from higher levels. In some cases detailed study was carried out before setting a standard. The standards set were to be realistic and attainable, not remote targets. Much of this preparatory work hinges on the reception of this idea by all concerned, of standards they expect to achieve in normal good practice, and to surpass when improvements in technique and general productivity are made.

The feeling that standards would be used as a 'big stick' was a natural reaction at this stage, and one which only diminished as confidence was gained and education extended. Standards should rather be a 'yardstick,' not a 'big stick.'

Existing Data

In many cases, particularly on the production side, there were standards available—for example, standards of steam raising, producer fuel, fuel into producers, C.W.G. outputs, etc., which are generally accepted in the industry and were known for many years before budgetary control was considered. Many of these, however, related to general practice—*e.g.*, the amount of steam that one would raise on boilers of various types under given load factors. Therein lies an important difference. We were setting standards for the Bournemouth plant under normal operating conditions, and as a result some of the generally accepted standards had to be modified. In some cases our results were better than the makers' normal recommendation figures; in some cases they were not. This did not prevent a standard from being set, and in this process alone we were given much food for thought.

In other cases no accepted standards existed. There was just nothing to fall back on.

This initial period was, I think, one of the most valuable, and resulted in definite and significant savings being made. The very fact that people were looking in detail at their own job from a fresh standpoint revealed many things which admittedly might have emerged in ordinary circumstances, but when taken in total it is probable that they would not have been revealed or savings made without the use of budgetary control.

The building-up of budgets, both for labour and expense from first principles rather than breaking down of global figures was again a most rewarding exercise. The ease to which these, once built, can be referred, gives improved departmental control.

Nevertheless, it was a period of uncertainty—uncertainty about meaning; uncertainty as to the extent to which measurement should be tackled; uncertainty as to whether it was any use putting this system into action. It called for a deal of faith, hope and tact on the part of all concerned. It was essentially a team effort with the full backing and encouragement of Mr. J. T. Haynes and with our various departments all playing a part. I should mention that all departments responded magnificently.

Simple Design and Presentation

We ought to look at some of the points met with at that time. One of the first things which emerged was the value of simple design and clear presentation. I expect figures to be presented clearly, forcefully, and economically. They should be cleanly and clearly shown. We spent at that stage quite a lot of time improving and tidying-up statements, and discarding those not clear. In some cases even temporary forms were printed, although to be discarded at a later date. It gave confidence that there was value behind the figures and that they had been presented with care and thought. At that stage it was a particularly valuable point.

It is important to have clear definitions when stating, say, the extent of a budget centre (*i.e.*, a defined department) or the boundary of a technical process or the meaning of a column heading (e.g., gas output, dry, debenzolised, etc.). As was hoped, the meaning of terms which once required constant explanation have now become understood and accepted.

It seems to me vital that, if the budgetary control system is to be extended elsewhere in our industry, such definitions and terms should be identical, if the system is to show its full value in inter-undertaking comparisons.

Use of Statistical Analysis

An interesting point which is perhaps not generally recognised is that the lack of a direct means of measurement on one section of a plant or activity does not preclude it from being the subject of control statistics. Most useful information and control can be obtained from other associated measurements, and these may be related back by statistical analysis. There is still much to be learnt in the use of this technique, though we have already found some interesting examples on the works. We have a little statistical section on the works to which all sorts of problems can be put. Although statistical analysis is not in any way essential to budgetary control, it can be very useful when used in conjunction with it. Some of our statistical problems involving the use of several 'dimensions' are at present being handled. We may need to use five, but the amount of calculations involved, even with a modern machine, is rather formidable. (The use of a simple electronic calculator would considerably widen the scope of this treatment.)

Throughout this first phase and up to this present time, the various existing measuring instruments and equipment were examined and overhauled where necessary, and new equipment was purchased from time to time, where thought to be justified—that is, where possible savings, or potential losses through lack of measurement, would outweigh the cost of the equipment.

Consolidation

The second phase, that of consolidation, began soon after the end of the first year, when the original budgets

had been reassessed, standards revised, and measurements improved. The initial strangeness of the system began to diminish and attention could be concentrated on what a statement was indicating rather than on the explanation and mechanics of the statement itself. In budget centres which were well established, there was naturally a process of tidying-up, such as in coding of expenditure, in the spread of charges, and in the adjustment of control basis.

It was very satisfying to see the gradual effect of bringing, say, a departmental operating statement into a condition in which it would move in close accord with its allowed costs, even though the activity of that department may have departed from that forecast for some external reason. Items in the statement which did not move as expected, threw up red or black variances, which drew attention to their presence. They did not, and could not, indicate what action should be taken as a result, for, as has been stressed repeatedly, the system does not purport to be a substitute for management. In this connection it is important to remember when considering appropriate action that there may be sympathetic effects in other budget centres. For example, a change in the quality of coal will affect the carbonisation budget centre and also may indirectly produce variances in by-product budget centres such as coke, oil, and tar.

I summarise the position we were in as we entered 1952-53.

The works outputs, the forecasts, and the various standards were well established (though there remained still a lot of work to do on certain of them). The works steam survey was in progress and the power survey was also being looked at. Attention was also being focused on the mixed gas variation—a difficult problem.

On the district side, for work on consumers' premises, the standards we set were for the main items (although on maintenance items we use actual results), but many normal items of work were considerably improved. District losses were reduced and education on the system was taken to inspector and senior fitter level.

On the mains department, which was dealt with towards the end of the installation, the standards were set on capital work. That is of use in our capital estimates, where, if we have a mains job in progress, the standard hours of work can be watched with a view to controlling the expense as the 75% completion stage is approached.

On the distribution side, we are not nearly so happy from the point of view of boosting. Measurement is a real problem there. So, for the time being, we are using the general gas sales activity as the control basis rather than the volume boosted. It is not strictly correct, of course, but the expenses can come forward in the ordinary way though the flexible budget will be less exact.

Education in the system is again being extended with advantage to technical assistants and maintenance departments; and I think we shall extend further in the near future.

Increased use is being made of the system to enable appropriate action to be planned in advance. Conditions to-day are far from stable. Abrupt changes in wages, prices and trading activity repeatedly occur. It is possible to obtain from the system a solution to various questions very rapidly without a laborious reassessment of all the many factors.

An appendix to the paper indicated some of the results achieved. The information given was a cause for gratification and a source of encouragement. The author concluded by saying that once one has reached as tight a standard as possible, the un-noticed backsliding which can occur without the use of the yardstick of budgetary control is prevented.

COMPANY NEWS

COLOMBO GAS AND WATER

The Colombo Gas and Water Company has declared a final dividend of 5%, making 8%, tax free, for the year 1953, which is the same as in the previous year. Net profit, after tax, etc., is £18,576 as compared with £16,560. Carried forward is £45,497 as against £38,417.

BRISBANE GAS

Profit for the half-year ended December 31, 1953, was increased by £6,581 over that of the corresponding period in the previous year, announces the Brisbane Gas Co., Ltd. The figure for 1953 is £39,138 as against £32,557. Sales of gas, balance from trading accounts and miscellaneous income amounted to £472,393 for the half-year, which represented an increase of £47,271. The directors declared on February 5 an interim dividend of 2¼%—this is a higher rate than for any half-year since 1946. The appropriation of profit is as follows: Transfer to reserves, £5,019; dividend, £28,750; carried forward, £5,369.

BELL'S ASBESTOS

The directors of Bell's Asbestos and Engineering (Holdings), Ltd., recommend the payment of a final dividend of 10%, less tax, on the ordinary shares for the year ended December 31, 1953. This involves a sum of £31,927, leaving a carry-forward of £102,224 as compared with £61,021. After providing for tax at £295,575 and deducting £7,611 for minority interests and preference shareholders of a subsidiary, net profit is £204,825 against the previous year's £217,060. A total of £213,666 is available for appropriation by the Holding Company, an increase on the figure of £188,285 for 1952.

WOODALL-DUCKHAM

Increased profits and dividend, and a one-for-three ordinary scrip issue are announced by Woodall-Duckham Construction Co., Ltd. Group profit for the year 1953 has increased from £840,312 to £949,330, while the net profit is £71,379 higher at £295,308. The recommended final dividend is 15%, making 20%, less tax, on the £450,000 ordinary as increased by a 12½% scrip issue. Similar rates were paid for the previous year on the £400,000 capital, the 1953 total absorbing £49,500 net, against £43,500.

PRIMITIVA HOLDINGS

After providing for the dividend on the 6% redeemable cumulative preference shares, the accounts of Primitiva Holdings, Ltd., show a deficit for the year 1953 of £3,452, which has been offset by a transfer from general reserve. For the previous year the deficit was £3,420. No dividends have been received from the Primitiva Gas Company of Buenos Aires or other subsidiaries in respect of 1953, and the directors of the holdings company confirm their statement made in 1946 that the ordinary dividend paid in that year was the last which could be expected. Because of the expropriation by the Argentine Government in March, 1945, of the assets of the Primitiva Gas Company, which is controlled by Primitiva Holdings, the Company made a loss of £7,457 for the year 1953, which has been offset by a transfer from general reserve. For the preceding year the loss was £9,739. No dividend is again recommended on the ordinary shares. The Argentine courts have not yet assessed the amount of compensation to be awarded for the expropriation of the Company's assets.

GAS PURIFICATION

The directors of Gas Purification and Chemical Co., Ltd., are proposing to acquire the share capital of Smart and Brown (Machine Tools) for £158,000. At a meeting on May 24, shareholders will consider proposals that the capital be increased to £100,000, the old and new shares be subdivided into 2s. shares and the articles be altered.

ALBRIGHT & WILSON

The group trading profit of Albright & Wilson, Ltd., for the year 1953, increased from £2,272,014 to £2,790,254, and the profit, before tax, from £1,526,518 to £1,782,570. The dividend has been increased to 17½%. In the review with the accounts, the Chairman, Mr. K. H. Wilson, anticipates that the Company will for at least several years to come be adding steadily and substantially to its fixed assets. The group has spent nearly £11 mill. on the extension of its manufacturing facilities in the last three years.

BABCOCK AND WILCOX

The directors of Babcock & Wilcox, Ltd., recommend a final dividend of 7%, less tax, on the £7,524,398 ordinary stock, payable June 3. With the interim of 7½% ordinary existing before the 50% scrip issue, the distribution for the year 1953 is equivalent to the 18%, including 3% bonus, paid on the smaller capital for 1952. Group profit, excluding two foreign subsidiaries, is £4,149,618, compared with £4,605,018 for the previous year, including dividends and interest on investments, and after all charges, including additional depreciation to cover replacement values which amounts to £577,148 and debenture interest, there is left £33,241.

Gas Consultative Councils

NORTH THAMES

Mr. Aberdein Justifies Advertising

Mr. S. G. Aberdein, Commercial Manager of the North Thames Gas Board, justified advertising by the nationalised industries to the North Thames G.C.C. at its last meeting at Westminster. He made particular reference to the gas industry and later the Chairman of the Council, Councillor Edwin Bayliss, gave figures showing the cost of producing and distributing *Modern Living* —the Board's news magazine.

Beginning with a brief review of the commercial activities of the Board, Mr. Aberdein said these were inseparably bound up with advertising and publicity generally. During the year ended March 31, he continued, the number of main meters increased by 22,810. Cash and hire purchases of appliances increased by £1,412,375 over the previous year. Showroom transactions numbered 5,484,314 during the year and facilities for payment of gas accounts through banks were extended to 12 additional branches.

Competition, especially with new housing business, was becoming very much more severe and the electricians were making a determined effort to capture the domestic cooking and water heating loads. 'They are employing shock tactics and various other devices to this end, such as demands for capital contribution towards the cost of mains and services unless provision is made for electric cooking and water heating.

'We are at some disadvantage when dealing with incoming occupiers of new dwellings,' Mr. Aberdein continued, 'as, in the majority of cases, the Electricity Board is contacted in the first instance to ensure that lighting is available in good time, when the opportunity is seized to sign them up for electric cooking and water heating before we have had an opportunity of approaching them."

The Younger Generation

Unfortunately, also, due to widespread publicity by the electricity industry, including manufacturers, and the training in electronics and other electrical devices that they received in the forces, the younger generation was becoming increasingly electricity minded. Many were already bent on being 'all-electric' and were 'sold' on the idea of only one service. If the gas industry was to progress, it was essential that gas should be kept before the younger generation as a modern fuel.

After showing the effects on sales of gas appliances during a series of sales campaigns in 1953-54, Mr. Aberdein cited the new 'eye-level' cooker as being an outstanding example of the power of advertising. This cooker was in the higher price range—selling at approximately £55—but the North Thames Gas Board sales were about 300 a week. In a large measure, this was due to the wide publicity given by the manufacturers.

The past year, said Mr. Aberdein, had been one of steady and continued progress and he considered that showroom and district representatives were to be congratulated upon the results they had achieved in face of strong competition, not only from electricity, but from solid fuel and oil both of whom freely advertised.

'On my many visits to the Salesmen's Circles, appreciation has been expressed of the backing they receive from advertising and publicity literature, which helps materially to lighten their task,' he said.

'In view of the several initial advantages the electricity industry enjoys, the withdrawal of publicity would undoubtedly unduly affect the gas industry adversely and if we are to continue as a virile industry and retain a keen, energetic force of representatives, they must be backed up by selective advertising.'

Mr. Aberdein concluded: 'Modern gas appliances show an appreciable economy of fuel to the users and any decrease in the installation of such appliances would result in a loss of business to our competitors and eventually to a decrease in gas consumption—with a resultant effect on the price of our commodity.'

Councillor Bayliss said the Board had told him that 'Modern Living' lost £525 per quarterly issue. The print order per issue was 125,000 of which 16,500 were sold to other boards. Cost of printing was £2,600. Revenue totalled £2,075.

Highly Commended

Mr. G. Carter expressed his doubts as to the value of the magazine as an aid to selling gas and suggested that the figures indicated a subsidy to the gas appliance manufacturers who advertised in the publication.

Councillor Bayliss said that at a recent meeting of gas consultative council chairmen the magazine had been highly commended by both the Parliamentary Secretary to the Ministry of Fuel and Power and the chairmen of other gas consultative councils.

NORTHERN

Unavoidable Rise in Gas Prices

Mr. E. Crowther, Chairman of the Northern Gas Board, told a meeting of the Northern Gas Consultative Council in Newcastle on May 10 that an increase of an average of 0.7d. per therm in the price of gas was unavoidable in view of the way the Board had been hit by the increase in the cost of coking coal, specially that from the Durham coalfield.

The Board's coal had gone up by 4s. 8d. per ton compared with the national average increase of all gas coals of 3s. per ton. In a full year coal supplies would cost an extra £200,000, but the extra charges for coke oven gas, the price of which was automatically geared to coal, would bring the total rise to £300,000.

Mr. Crowther said that another burden was that national awards had increased the annual bill for wages and salaries by £130,000; rail charges were up by £30,000; while export markets for tar and other by-products were weaker. Income from these sources was expected to be down by some £150,000 a year.

The Board, continued Mr. Crowther, had stated that it would attempt to carry these latter burdens without passing them on to consumers, but at the time the assurance was given it was made clear that no further additions to its expenses could also be carried. In fact, a new and heavy addition had been created through the bill for coal and coke oven gas.

'No Alternative'

In order to implement its earlier promise to the Consultative Council the Board would continue to try to meet all the other extra costs named, but it had no alternative but to recover this final expense through its gas prices.

Mr. Crowther recalled that when in early 1953 an all-round addition of 10% was made to coal prices the Board refused to alter its published prices of gas. Instead it withdrew the prompt payment discounts which operated previously. It might be asked why the Board was not prepared to switch from the Durham coal used to unscreened coal which could be bought at 1s. 10d. less. Any saving which might thus be made would be lost on the extra cost of transporting it by rail from the alternative collieries.

N.C.B. Policy

Mr. Crowther believed that the extra cost of coking coal from Durham had much to do with its export value. 'These coals are eagerly wanted on the Continent, more than any other kind of coal in the country, I believe,' he said. He thought that the N.C.B. was following a mistaken policy by grouping gas coal with coking coal. If the two types were separated the result in cost to the Gas Board would be different.

The N.C.B. had been challenged on the differential increase in coal prices. In addition, the Minister of Fuel and Power had also been told that the Board was disappointed that this area had been unfortunate once again when prices were increased.

Mr. Crowther added that the new prices would take effect after the present accounts had been cleared up.

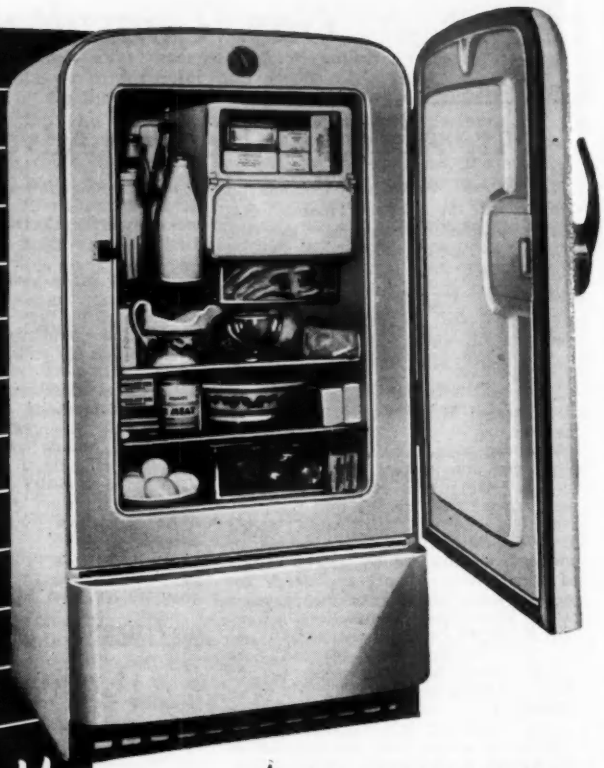
After Mr. Crowther left the meeting, the Council decided to ask the Northern Group of M.P.s to receive a deputation headed by Alderman J. Hoy, Chairman of the Council, to urge that coking coal and gas coal should be separated in the Coal Board's price grouping scheme.

Mr. R. A. Cookson, representing industrial consumers, warned the Council that the gas price increases might well affect exports. 'These increases can be a very serious matter for industry. I cannot help fearing that they may result in higher costs which may mean a loss of export trade in this area.'

Alderman Hoy said that the increases had been decided upon in the light of a very exhaustive survey. They had to be faced fairly and squarely.

(*Consultative Council reports continued on p.* 451)

First in the field with a 10 year guarantee on its sealed unit



★ Features of the Main Refrigerator include ample storage space, a larger than usual frozen-food compartment and superior finish. An absorption-type model, it is silent in operation and cannot cause interference to radio or television reception. Attractive appearance with white enamelled cabinet of modern design. Hygienic easy-to-clean interior is vitreous enamelled.

CAPACITY
3.2 cubic feet (Gross).

SHELF AREA
6.3 square feet including base of liner.

FROZEN-FOOD STORAGE
Storage space for about 4 lbs. of frozen-food and 2 lbs. of ice.

ICE TRAYS
2 Aluminium trays with lever device for easy removal and flexible plastic dividers. 2 lbs. of ice (32 cubes) per freezing.

CONTAINERS
2 interchangeable, covered, plastic dishes for the storage of meat or fish and for salads.

CONTROL OF TEMPERATURE
A thermostat gives a controlled temperature in the cabinet. Gas supply is governed to eliminate variations in mains pressure.

DEFROSTING
Gas control tap has a defrost position.

FLINT LIGHTER
A flint lighter, operated from the front of the cabinet, is provided for ease of ignition.

GAS CONNECTION
⅛" B.S.P. male or ¼" B.S.P. female.

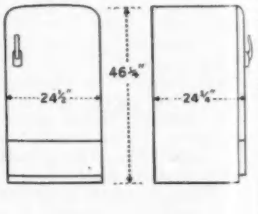
LEVELLING DEVICE
Four levelling screws are fitted to ensure correct alignment.

GUARANTEE
The cabinet and accessories (except plastic dishes) are guaranteed for ONE YEAR and the sealed cooling unit for TEN YEARS.

DIMENSIONS
Exterior as shown on diagram.

Cabinet interior
Height..27 in.
Width..17 in.
Depth..12 in.

Frozen-food compartment
Height..4½ in.
Width..8⅝ in.
Depth..12 in.
(Actual)



The MAIN 32 REFRIGERATOR

★ Note the name-made by MAIN

MAIN REFRIGERATION LTD., GOTHIC WORKS, EDMONTON, N.18

R2

EAST MIDLANDS

Gas Prices: A Reiteration

The East Midlands Gas Consultative Council, in Nottingham on May 4, heard Mr. Sydney Smith, Chairman of the East Midlands Gas Board, reiterate his earlier statement that they were holding gas prices despite other increases in costs.

The recent increase in coal prices would cost them about £200,000 a year, which meant taking into account their own price reductions announced last December and other increased costs. They had to find additional annual revenue amounting to £830,000.

Mr. Smith said the Board intend to implement their earlier promises not to increase prices except as a last resort, and they had decided, therefore, to make an increase in gas prices for a minimum period of six months.

It had been no easy decision. On paper the figures indicated that there was only one thing to do—to pass some of the burden on to the consumers. 'We still believe that a policy of stabilised prices will, in the long run, so develop our business that we should be able to sell at present levels and still balance our accounts,' said Mr. Smith.

'Problematical'

They could not run a business on hope alone, and the Board planned to keep production costs down by increased efficiency, by the installation of new plants, and by gradually closing down uneconomic manufacturing stations. They were also constructing a new main pipeline to transmit purchases of coke-oven gas, and gas made at the more economic plants in the coal-field areas of Derbyshire, through Leicester and down to Northampton. Concluding, Mr. Smith said it would be misleading to pretend that the holding of their present price structure was anything other than highly problematical.

Representations were considered from the Nottingham and District Master Bakers' and Confectioners' Association seeking a special tariff for baking, and from the Northampton and District Fish Friers' Association requesting that the recent concessions in the price of gas to domestic consumers should be made available to commercial consumers. Both spoke of turning to oil for heating.

Alderman C. R. Bates, Chairman of the Council, said it was impossible to provide cheaper gas. Under the Gas Act there could be no special tariffs.

It was agreed that members of the two associations should be interviewed by representatives of the Gas Board and have the reasons explained to them why they could not have cheaper gas.

Ministerial Slight

It was revealed that the Ministry of Fuel and Power had refused to reappoint Alderman C. R. Bates as Chairman. His official retiring date is May 11. Further, the Ministry had twice refused to meet deputations from the council seeking Alderman Bates' retention, saying it would serve no useful purpose. It is understood a new chairman has still to be appointed.

There were many criticisms of the Ministry's decision, and Councillor H. C. Martin (Chesterfield), Chairman of the Notts. and Derbyshire Divisional Committee, thought the Minister had made a mistake and that the refusal to meet the deputations was a slight on the Council.

Alderman Bates, aged 71, said he knew of no reason why he should be retired except that he was over 70. He had held office since vesting day and had never missed a meeting.

SOUTH EASTERN

A Lone Plea

The Chairman of the South Eastern Gas Consultative Council, Councillor A. B. Constable, read at a meeting at Westminster on May 4, a letter from a consumer asking the Council to support his application for a supply of gas. Permission has not been granted for the laying of gas mains on the Old Hill Estate, Woking, where the consumer intends to live.

Councillor Constable had been informed by the Board's Commercial Manager that negotiations were still pending and recommended that the matter be left open until further information was available.

Another letter had been sent by a London consumer who complained of unnecessary calls by the Board's meter readers. This matter had been referred to the divisional sales and service manager who said the additional calls were made during the daily routine of the meter reader.

Mr. W. Eastwick said he could not entirely agree with the allegation of a waste of time. It would seem reasonable that if a second meter reader was in the neighbourhood with knowledge of an outstanding call he would automatically include it in his routine. Another Council member, however, Mr. J. E. P. Moore, insisted that duplication was obvious. From the consumer's point of view, it indicated a waste of time and money. It might have been fortuitous that another meter reader was in the vicinity—but the consumer would not know that. Mr. Moore thought that if a dial card was left at an address, a reasonable period should be allowed to elapse for the card to be returned to the Board's offices. Councillor N. C. Rogers supported Mr. Moore's contention and the Secretary was instructed to convey the Council's views to the divisional sales and service manager and to write an appropriate letter to the consumer.

When Mrs. D. N. Rathbone, Deputy Chairman, addressed the Council on publicity, she understood that part of the North Thames Gas Board publication 'Modern Living' had been allocated to the North Thames G.C.C. As this was a magazine for consumers the North Thames G.C.C. received some publicity from it. After she had finished speaking, other members of the Council wanted to know if a similar sort of publicity could be arranged within the South Eastern Gas Board's area. The Secretary was asked to make inquiries.

Mrs. Rathbone had been invited to speak by the Chairman after formal sanction had been given by the Council for the production of posters and leaflets as in previous years.

Union Resolutions Suggest Gas Industry Probes

Ten resolutions on various aspects of the nationalised gas industry will be discussed at the 39th congress of the National Union of General and Municipal Workers to be held at Rothesay from June 14 to 17.

An Aberdeen resolution views with alarm the increase of the administrative staffs in gas undertakings in Scotland since nationalisation. It claims that recruiting for these posts is from outside the gas industry and far in excess of the requirements of the industry. 'This may well be one of the reasons for the increase in the price of gas in Scotland recently announced,' asserts the motion.

It ends by asking the congress to instruct the N.E.C. to investigate the position.

Two other resolutions call for the setting up of a private committee, or a court of inquiry, to inquire into the running and efficiency of the nationalised gas industry.

United Kingdom Interests Transferred

The Minister of Fuel and Power, in exercise of powers conferred on him by Section 24 of the Gas Act, has made an Order transferring in various area gas boards the property, rights, liabilities, and obligations of the former United Kingdom Gas Corporation which, under the Act, had vested in the North Western Gas Board.

The Order—entitled the Gas (United Kingdom Gas Corporation) (Transfer) Order, 1954 (Statutory Instrument 1954, No. 526)—provides for the transfer, as from May 1, of the shares in the Hemsworth and United Kingdom Coke Oven Co., Ltd., to the North Eastern Gas Board and the gas undertaking at Merthyr Vale, Glamorgan, to the Wales Gas Board. Two heritable properties in Scotland and any property or rights relating to them together with any other property or rights in Scotland which belonged to the United Kingdom Gas Corporation and which remains vested in the North Western Gas Board, are transferred to the Scottish Gas Board.

Smokeless Zones

Co-operation of the North Western Gas Board in a smokeless zone experiment to be carried out on a Manchester housing estate is being sought by the city's Health Committee. Representations are being made to the Gas Board to urge that adequate supplies of coke of the right quality are made available during the period of the experiment.

The Board is also being asked to review prices of coke 'in order to encourage its increased use and also to ensure so far as it can that no difficulty shall arise in the delivery of coke at regular intervals to tenants.' The Health Committee has authorised arrangements for the establishment of a voluntary smokeless zone in the Woodhouse Park area of Wythenshawe and part of the Newall Green area for an experimental period of six months from July 1.

The Committee has also asked the Manchester Housing Committee to consider the desirability of making it a condition of tenancy of all future lettings of flats and houses equipped with smokeless solid fuel appliances that only solid smokeless fuels should be consumed in the appliances.

Yorkshire Juniors

President's Day of the Yorkshire Junior Gas Association was held at Cleckheaton on May 5, when a large turnout of members supported their President, Mr. A. Cole, on a visit to the Moorend gasworks of the North Eastern Gas Board. In the morning the party assembled in the works, where they inspected many new projects, and were later entertained at lunch in the Town Hall, Cleckheaton. Following the Presidential Address (see p. 441), there was a visit to the works of British Belting and Asbestos, Ltd., where members spent an interesting afternoon seeing the manufacture of a wide range of asbestos products.

At the Moorend works, where they were welcomed by Mr. M. Cole, members found much to hold their interest in the way of new developments. As example was the recently completed 'Research and Development Centre' erected on a site within the gasworks by W. C. Holmes & Co., Ltd. A feature of this centre is a separate laboratory capable of holding comparatively large pilot plant. A full scale 1 mill. cu.ft. per day dynamic gas purifier erected by W. C. Holmes naturally was a centre of interest.

A small experimental butane blue water gas unit installed in 1951 by Humphreys & Glasgow, Ltd., was also inspected. The unit is of standard pattern, butane vapour being used as the carburetting medium. Other new plant in course of erection at this works includes a 1½ mill. cu.ft. per day C.W.G. unit by the Power Gas Corporation, complete with relief holder, new exhausters, new condensers, and new detarrer. The carbonising plant by Woodall-Duckham was also inspected. No. 2 bed of this installation is at present being rebuilt.

At a luncheon in the Cleckheaton Town Hall after the works visit, Mr. Cole, President of the Yorkshire Juniors, extended a welcome to the many guests, who included Mr. Jennings, who was Engineer and Manager at Spenborough for 40 years. Mr. Cole said how pleased he was to have the support of Mr. McDonald, Member of the N.E.G.B., Mr. Johnston, Mr. Appleyard, and Mr. Tilley. Reference to the remarkable development work being done by W. C. Holmes at their new research centre was made by Mr. Cole, who thanked Mr. Charles Cooper and Mr. Priestley for all they had done.

The Chairman of Spenborough U.D.C., Mr. A. Siddle, in thanking the President for his welcome, said that Spenborough was proud of its gasworks. When the North Eastern Gas Board took over the works, Mr. Jennings had already accomplished a great deal, and the Spenborough U.D.C. remained very proud of his work.

Mr. D. Henderson, Senior Vice-President of the Yorkshire Junior Gas Association, calling on Mr. Cole to give his Presidential Address, complimented him on the progress he had made in his career in the gas industry. Starting at Bradford gasworks he later served under Mr. Tilley at Brighouse, before leaving to take up an appointment with Mr. McDonald at Harrogate. After nationalisation he left for Huddersfield and was later appointed to his post at Spenborough.

A vote of thanks to Mr. Cole for his Presidential Address was moved by Mr. J. White.

N.B.A.

After 35 years valuable service to the benzole industry, the National Benzole Association (N.B.A., Ltd.) is being replaced by the National Benzole and Allied Products Association (N.B.A.).

Broadly, the new Association will assume the responsibilities hitherto undertaken by N.B.A., Ltd., but, as the name implies, it will concern itself with toluole, xylole, and naphtha, as well as with benzole. It will replace N.B.A., Ltd., as the British representative to the International Conference of Benzole Producers.

The first annual general meeting of the National Benzole and Allied Products Association was held on April 30, when the following officers were elected:

President: A. K. Steel, National Coal Board.

Vice-President: L. W. Blundell, North Thames Gas Board.

Executive Committee: M. Barash, East Midlands Gas Board; H. H. Bates, National Benzole Company, Ltd.; A. Bradbury, Staveley Iron and Chemical Co., Ltd.; J. Colligon, Dorman, Long & Co., Ltd.; A. S. Davies, Guest Keen Baldwins Iron & Steel Co., Ltd.; F. W. O. Doddrell, N.C.B., North Eastern Division; C. M. Frith, South Yorkshire Chemical Works, Ltd.; F. A. Jackman, Carless, Capel, & Leonard, Ltd.; C. J. Johnson, North Thames Gas Board; C. B. Lane, Lancashire Tar Distillers, Ltd.; D. G. Moody, N.C.B., East Midlands Division; and J. B. Vickers, Yorkshire Tar Distillers, Ltd.

The Secretary of the Association is Mr. W. E. Cartwright, and the office is at Wellington House, Buckingham Gate, London, S.W.1.

The Staff of the Scottish Fuel Efficiency Committee is to transfer *en bloc* to the new National Industrial Fuel Efficiency Committee Service, and to continue the work already in progress in Scotland. Sir Leslie Hollinghurst, Chairman of the Service, visited Glasgow last week to confer with Sir Patrick Dollan and other fuel conservation leaders.

Cambridge Instrument Company, Ltd.—The long and close association of the University of Cambridge with the Cambridge Instrument Company was signalised on April 28 and 29, when the Company held an 'At Home' at their works in Cambridge. Invitations were issued to the professors, teaching staffs, research students, and senior men taking science subjects in the University. During the two days over 700 visited the works, and were entertained at tea. All sections of the factory and the research departments were open for inspection, and there were various interesting demonstrations.

Gas Industry Superannuation

The Ministry of Housing and Local Government has issued to all local authorities in England and Wales a circular dealing with the Superannuation (Local Government and Public Boards) Interchange Rules, in which it is pointed out that the Gas Council and the area boards were designated on April 8.

The Gas Council Staff Pension Scheme (which is one of 13 identical schemes deemed to have been established on May 1, 1949, one for each of the area boards and one for the Gas Council) contains provisions to pay and receive transfer values in respect of employees who transfer between service with the gas industry and local government service in circumstances in which rules made under section 2 of the Superannuation (Miscellaneous Provisions) Act, 1948, apply. The Gas Board Protected Persons Superannuation Scheme also contains powers to pay transfer values in these circumstances.

These general powers have been expanded by an undertaking on the part of the Gas Council that where a former local government employee becomes a participant in the Gas Council's or area board's scheme the service by reference to which the transfer value was calculated shall reckon in the scheme on a year for year basis; non-contributing service shall reckon at half length for the purpose of calculating benefits; reckonable service in the local government superannuation scheme before the age of 20 shall count as 'pensionable service' in the industry's scheme on the understanding that up to age 65 for men and 60 for women 'pensionable service' is limited to 45 years and 40 years respectively; all service will reckon at its full length for purposes of determining whether any benefit is payable, and 'qualifying service' will also be reckonable for that purpose.

A contributory employee who is making but has not completed making additional contributory payments will be able to continue his payments and to reckon the service in full.

The Gas Council's and area board's schemes having been made after the National Insurance Act, 1946, came into force, have no provisions for modification of contributions and benefits. It has therefore been necessary to come to an arrangement with the Gas Council and area boards about the status, whether modified or unmodified, of persons moving from the one employment to the other. It has been agreed that a local government employee entering the gas industry shall bring an appropriate transfer value payment according to his status at the time of transfer and shall be entitled to a corresponding transfer value on subsequent return to local government service.

A person who is a member of the industry's scheme and whose continuous service in the gas industry commenced before July 6, 1948, will, on transfer to local government service, be treated as an unmodified contributor and a transfer value be paid accordingly. A person whose continuous service commenced on or after that date (other than one as already referred to who had previously transferred from local government service with a transfer value) will be treated as modified.

These arrangements do not of course apply to persons subject to the Protected Persons Scheme, who have retained their local authority superannuation rights. Transfer values will be calculated on the basis of the local government tables for the time being in force under section 29 of the Act of 1937, due allowance being made for modification where necessary and they will be paid whenever the transfer takes place after the date of designation.

Trade News

The 'Hadrian'

The new 'Hadrian' fire produced by Radiation Ltd. is illustrated below, and it can be seen that it is in the New World 'Silent Beam' tradition of good appliance design.

There is a choice of three attractive finishes — gold, bronze, or parchment (stone)—and it can thus be introduced successfully into a room with almost any decorations scheme. The Radiopanels give a glowing surface with the appearance of considerable depth.

The fire is rated at 16,000 B.Th.U. per hour.—*Radiation Group Sales, Ltd., Radiation House, 7, Stratford Place, London, W.1.*

The 'Hadrian'

Lightweight Hydraulic Puller

A new general purpose mechanical-handling device is the Brettell hydraulic puller and tensioning machine, manufactured by A. G. Wild & Co., Ltd. It takes the form of a double-acting hydraulic pump, manually operated, whereby a piston rod is retracted into a cylinder. A pull of 10,000 lb. can be exerted by a single-handed operation of the actuating lever, yet the total carrying weight is only 44 lb. The compact design enables it to be used in confined spaces and the automatic return of the piston rod ensures speedy operation. The design embodies a pressure relief valve which affords protection against overload on the mechanism.

High-duty light alloy has been utilised wherever possible in construction. An eye for anchoring is provided at the rear of the device, while the piston rod has a chain adaptor fitted to its end.—*A. G. Wild and Co., Ltd., Sheffield.*

Automatic Control

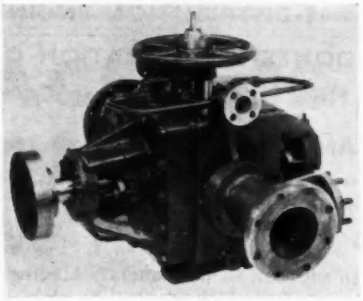
The application of automatic control to processes which require composite-control schemes has necessitated the development of auxiliary pneumatic apparatus to work in conjunction with the basic single-term or multi-term controller unit. George Kent, Ltd., are manufacturing a range of diaphragm units to extend the operation of their Mark 20 class of controllers in their normal performance when used in composite-control schemes; and are making these units available for general use in the process-control field.

The units are fitted into a control circuit where it is necessary to alter the magnitude of the control signal or combine two or more signals. The input and output signals are in the usual 3-15 lb. per sq. in range, and the output signal from the unit is accurate to within ± 0.2 lb. per sq. in. of its theoretical value. This accuracy, we are informed, is attained with a high rate of response and complete stability of operation. Further information and literature may be obtained from *George Kent, Ltd., Luton, Bedfordshire.*

The Plenty Pump

The Plenty pump, illustrated here, is a special patent design of rotary force pump claimed to combine the advantages of a centrifugal with those of a plunger force pump. It is of particular use for the pumping of heavy viscosity liquids such as tar and pitch and can stand up to the most arduous duties. Its volumetric efficiency is high, and its construction enables suction lifts of 25 ft. to be obtained, while 350 lb. per sq. inch is maintained on single-stage units on the output side.

The internal parts consist of a solid forged shaft with carefully machined slots, into which fit two pairs of sliding blades. The blade edges are machined so that the shaft assembly fits closely the special rotor which is mounted eccentric to the shaft. The rotor has ports which automatically distribute the flow to the ports.



The Plenty Pump

This form of construction, it is claimed, has a number of advantages, some of which are as follows:—

(i) The eccentricity of the rotor can be easily varied and the output of the pump reduced or reversed while using a constant speed unidirectional prime mover.

(ii) The sliding blades move only a short distance per revolution in the rotor, and wear, therefore, is low.

(iii) All contacts between suction and pressure sides are amply proportioned areas. This makes the volumetric efficiency high and enables a suction of 25 ft. to be obtained.

(iv) The nature of the pump enables it to be used for highly viscous liquids (up to 20,000 sec. Redwood No. 1) while the high efficiency makes it suitable for low viscosity liquids, such as benzole or petrol.

(v) As there are only four moving parts within the pump it can be easily cleaned and no extensive fitting is needed when repairs are required, as new shafts complete with blades and rotor can be easily re-inserted.

Two types of pump are made ranging from 60 gal. per hour to 350 tons per hour. In the 'General' type the eccentricity is fixed and the output depends on the speed of the prime mover, while for the 'Universal' type the eccentricity is continuously variable as required. The pumps throughout the range can be supplied steam-jacketted and are usually supplied fitted on a bedplate with gearbox and motor, whether it be steam or electric.

Pumps are often manufactured for handling chemically corrosive or dangerous liquids and the use of stainless materials or nickel alloys with special gland seals present no difficulties.

The pumps, we are informed, are in use by the majority of gas boards for dealing with ammoniacal liquors, creosote, tar, benzole, unwashed oils, and phenolates. For washing purposes they are frequently used for caustic soda solution.—*Plenty & Son, Ltd., Eagle Iron Works, Newbury.*

TRADE PUBLICATIONS

Among new publications is a brochure by the Industrial Pipework Division of *William Press & Son, Ltd., Willoughby Lane, Tottenham, N.17,* presenting by data and illustration the firm's methods of production and erection of pipework.

There has just been published by the *Quasi-Arc Co., Ltd., Bilston, Staffs,* a six-page illustrated technical circular (No. T.C. 898) describing the firm's D.C. arc welding rectifier type M.R. 375. The circular, copies of which can be obtained from the Company at the foregoing address, sets out in detail the advantages to be gained in the use of this equipment.

An illustrated and very well produced catalogue reaches us from *Plenty & Son, Ltd., Eagle Iron Works, Newbury,* describing the Plenty patent rotary displacement pump, first brought out in 1935. The present enviable position of this pump for specialised arduous duties is the result of intensive development work combined with the accumulated experience of over 150 years in a wide range of engineering. The firm was founded in 1790.

Metal Scaffolding, No. 36 in the Ministry of Works series of Advisory Leaflets, published by the Stationery Office (price 3d.), is intended mainly to help the small builder who wishes to erect his own scaffolding or hired components. It deals with simple types of 'putlog' and independent scaffolds for house building and maintenance work up to three or four storeys. A typical scaffold of each type is illustrated to show how the various components are assembled and how bracing should be carried out when this is necessary. Information is given on materials used for scaffolding, spacing of standards (according to the load to be carried), the working platforms; attention is drawn to the importance of tying-in and inspection; and there is a useful summary of 'Points to Remember.'

WALTER KING SERVICES

PERIODICALS . . .

GAS JOURNAL. *(Weekly.* Wednesday, By Post, **1s. 5d.**)

The "Gas Journal" has existed as an integral part of the Gas Industry since 1849. Unbiased policy, technical knowledge, accuracy and reliability combine with an extensive news service and modern make-up to make the Journal the leading Gas Industry newspaper.

Annual Subscription (including a copy of the "Gas Journal" Calendar and Directory): Home and Empire, **52s.** ; Foreign, **60s.**

GAS SERVICE. *(Monthly.* By Post, **1s. 2d.**)

"Gas Service" is the specialist magazine for the Sales and Service personnel of the Industry. It covers all aspects of gas service from the holder to the burner. In addition to sound editorials, news items and specially contributed articles, "Gas Service" also reports in the fullest possible manner the activities of the numerous Salesmen's Circles.

Annual Subscription: Home and Empire, **12s.** ; Foreign, **15s.**

BOOKS and ANNUALS . . .

Some current works covering the manufacture, distribution, and sale of gas are :—

KING'S MANUAL OF GAS MANUFACTURE. Now being issued in 10 self-contained sections. Sections available and prices on application.

MANUAL OF GAS FITTING. By R. N. Le Fevre. **30s.**

GAS DISTRIBUTION ENGINEERING. By R. N. Le Fevre **22s. 6d.**

DOMESTIC UTILIZATION OF GAS. By Smith & Le Fevre **20s.**

High Pressure Gas Main Construction (Restall), **10s. 6d.**

ANNUALS:—

"Gas Journal" Calendar and Directory, 25s. ; "Gas Service" Pocket Book (1954 Edition) **5s.**

BINDING . . .

In addition to permanently binding subscribers' journals, (particulars and prices for which we shall be pleased to give on application) we can supply TEMPORARY BINDERS for the Gas Journal, Gas Service and King's Manual of Gas Manufacture, thus enabling readers to *bind their copies as received.* The danger of mislaid or damaged copies is eliminated.

Gas Journal temporary binder, Gas Service ,, } . . . . **13s. 3d.** each inc. postage.
King's Manual ,, ... **9s. 9d.** each inc. postage.

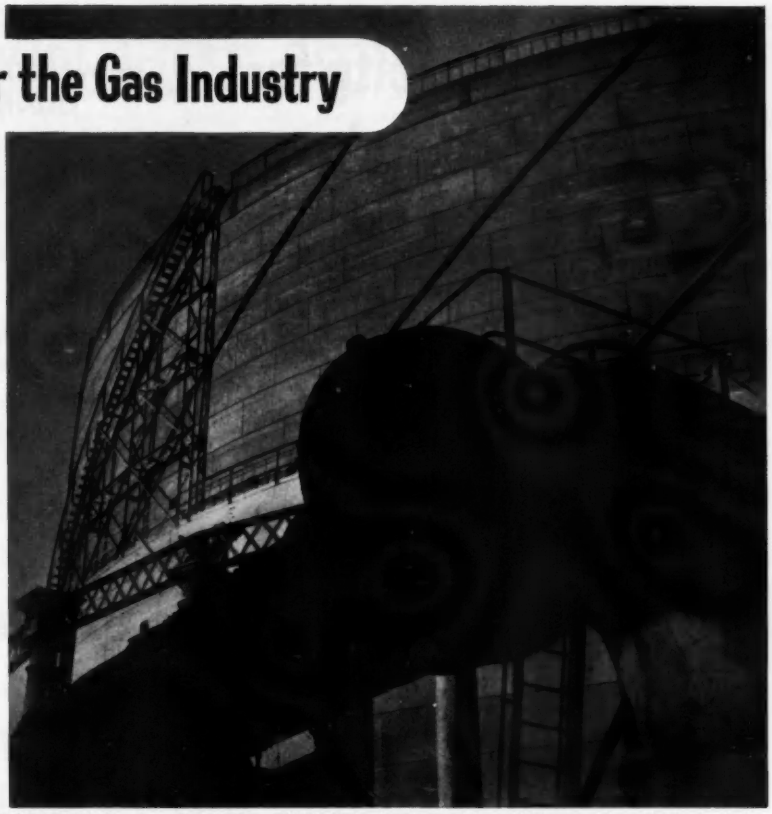
PHOTOGRAPHY . . .

Walter King Photographs specialize in Gas Industry photography of every description—work in progress series, plant, appliances, showroom displays, exhibition stands, social and educational visits of all kinds. Tours for various areas of the country can be arranged. First class photography at competitive rates. Full particulars on application.

WALTER KING LTD., 11 BOLT COURT, FLEET STREET, LONDON, E.C.4

Central 2236-7.

Photograph by courtesy of the Gas Council



Aluminium Paints for the Gas Industry

"LUMEROS X" High Heat Resisting Paint.
Represents the latest and greatest advances in the protection of iron and steel subject to very high temperatures. "LUMEROS X" gives adequate protection at temperatures up to 600°C. Suitable for indoor and outdoor use. Good water resistance. No undercoat required. Available in Aluminium or Black.

"METAL" Aluminium Paint.
A general purpose paint of the highest quality and durability and possessing great brilliance. For indoor and outdoor use. Whilst not specifically designed as a heat resisting coating "METAL" will stand temperatures around 212°F (100°C).

"METAL" (Thermal).
Specifically designed for indoor and outdoor use on metal surfaces up to 350° F (177°C).

BRITISH PAINTS LIMITED

PORTLAND ROAD, NEWCASTLE-UPON-TYNE, 2. - CREWE HOUSE, CURZON STREET, LONDON, W.1

ALCON

PACKLESS SOLENOID CONTROL VALVES

—give 100% shut-off

Products of 25 years experience in design and construction of Solenoid Valves . . . .

- Packless — no glands — less friction.
- For GAS, OIL, AIR, or STEAM.
- Noiseless.
- Positive in action.
- Pressures up to 300 lbs. per sq. in.
- Non-corrosive magnetic system.
- Operate direct from A.C. mains.

Also available with manual re-set.

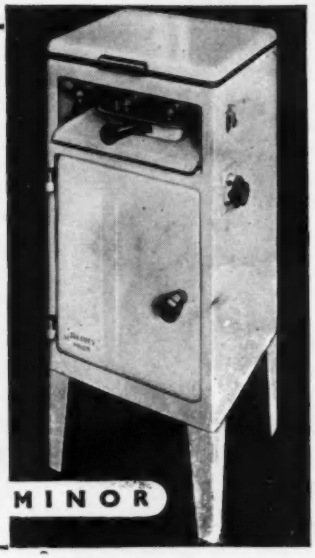
Write for literature to :

ALEXANDER CONTROLS LTD.

141 WOOD END LANE, ERDINGTON, BIRMINGHAM 24. 'Phone : ERDington 2485/6

BIG Capacity for LITTLE Kitchens

Especially suited to the kitchens of flats and small houses, this highly efficient cooker provides utmost cooking capacity in the least possible space. Cast iron construction ensures strength and durability and reduces maintenance costs to a minimum, thus making the Dainty Minor particularly suitable for simple hire or hire purchase.



Approved and adopted by leading gas boards

The **Dainty** MINOR

R. RUSSELL & SONS, LTD., DERBY
Agents for Scotland and Northern Ireland:
JAMES R. THOMSON & CO. LTD., 41, YORK STREET, GLASGOW, C.2

WELDING
GUNNING
SPRAYING
OF GAS RETORTS

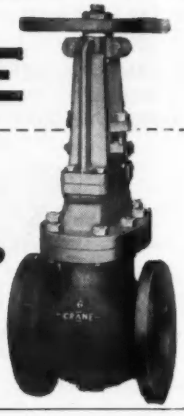
EB

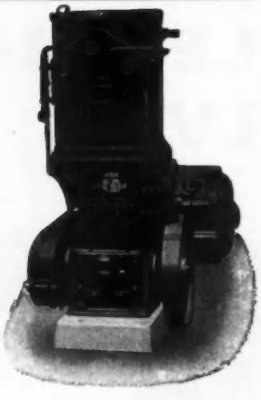
Write for particulars of how E. B. Service can help in reducing maintenance costs. Manufacturers of all types of Cements.

E. B. REFRACTORY CEMENT CO. LTD.
Oakfield Offices, Brettell Lane, Stourbridge

CRANE

VALVES for Gas, Steam, Water, Oil and Air

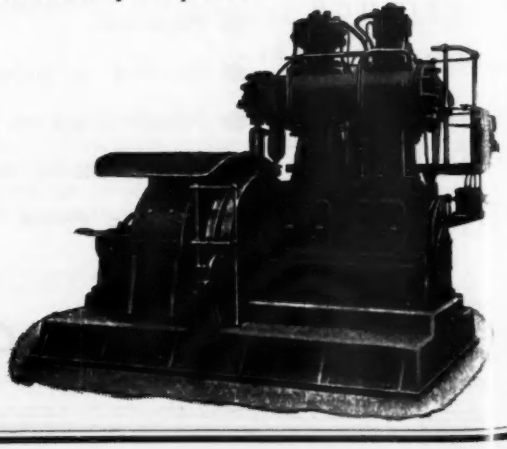




HIGH PRESSURE GAS COMPRESSORS *for pressures up to 5,000 lbs. per sq. in.*

The illustrations show two high pressure gas compressors which we made recently to order. As specialists in the design and manufacture of compressors for both air and gases, we make compressors for a wide range of capacity and pressure up to 5000 lbs. per sq. inch.

The compressor shown above has a capacity of 25 cu. ft. of free hydrogen per minute compressed to 3000 lbs./sq. inch. The illustration on the right shows a four-stage compressor with a delivered capacity of 200 cu. ft. of free town's gas per minute compressed to 5000 lbs. per sq. inch.



For full information regarding gas compressors, write, giving particulars of the duty required, to—

REAVELL & CO., LTD.
RANELAGH WORKS, IPSWICH
Telegrams: "REAVELL, IPSWICH." Phone Nos. 2124 & 2125

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words)—minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep × 7" wide; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

WALTER KING SERVICES—3

KING'S MANUAL OF GAS MANUFACTURE

Now being issued in 10 self-contained sections. Sections available, and prices, as below :

SECTION	1	CARBONIZATION: HORIZONTAL RETORTS	13s. 9d. inc. postage
,,	2	VERTICAL RETORTS	7s. 9d. ,,
,,	3	WATER GAS AND COMPLETE GASIFICATION	7s. 9d. ,,
,,	4	COKE OVENS	7s. 6d. ,,
,,	5	REFRACTORIES: COAL AND COKE HANDLING	7s. 9d. ,,
,,	6	GOVERNORS: EXHAUSTERS: STATION METERS	9s. 9d. ,,
,,	10	INSTRUMENTATION	5s. 3d. ,,

OTHER SECTIONS IN ACTIVE PREPARATION.

FROM

WALTER KING, LTD. 11, BOLT COURT, FLEET STREET, LONDON, E.C.4.

OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

Send your enquiries to

GAS PURIFICATION & CHEMICAL COMPANY LIMITED

ESTABLISHED 1873

PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

IT'S NEW!

CHLORO-FLASH BY

NU-SWIFT!

EXTRA-RAPID for EXTRA-HAZARDOUS FIRE RISKS : Chlorobromomethane, science's new wonder chemical in pressurized charges. Approved by F.O.C. You've never seen anything like it!

NU-SWIFT LTD · ELLAND · YORKS

In Every Ship of the Royal Navy

"KLEENOFF" *

THE COOKER CLEANER

"KLEENOFF"

FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *

KETTLE DESCALER

For resale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.

7, CROMPTON WAY, CRAWLEY, SUSSEX

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is accepted from the provisions of the Notification of Vacancies Order, 1952.

JERSEY GAS LIGHT CO., LTD.

APPLICANTS for the position of JUNIOR TECHNICAL ASSISTANT are thanked and informed that an appointment has now been made.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP
DEPUTY PERSONNEL OFFICER

APPLICATIONS are invited from suitably qualified men for the above pensionable position, at a salary within Grade A.P.T. IX (£635-£735 per annum).

Detailed applications, giving the names of two referees, should be addressed to the Chief Personnel Officer, North Western Gas Board (Liverpool Group), Radiant House, Bold Street, Liverpool 1, within fourteen days.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP
ASSISTANT CHIEF CLERK—
GROUP DISTRIBUTING ENGINEER'S OFFICE

APPLICATIONS are invited for the above pensionable appointment at a salary within Grade A.P.T. VII (£565-£645 per annum).

Applicants should have knowledge and experience of material progress records and an Accountancy qualification would be an advantage.

Detailed applications, giving the names of two referees, should be addressed to the Chief Personnel Officer, North Western Gas Board (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, within fourteen days.

EASTERN GAS BOARD

NORWICH DIVISION
HOME SERVICE ADVISER

APPLICATIONS are invited for the position of HOME SERVICE ADVISER.

Salary range £384-£472 per annum. Commencing salary to be commensurate with the experience and capabilities of the successful candidate.

Candidates should possess a recognised Diploma in Cookery or Domestic Science, and be experienced in the practical demonstration of Gas Cooking and other Gas Appliances, and be able to advise consumers on all domestic problems involving the use of gas in the home.

The successful candidate may be required to pass a medical examination, and unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, stating age, experience and present position, giving full particulars of training and qualifications, together with the names of two referees, should reach the undersigned within fourteen days of the appearance of this advertisement.

R. A. WESTON,
General Manager,
Norwich Division.

Eastern Gas Board,
Divisional Office,
Thorpe Lodge,
1, Yarmouth Road,
Norwich, Norfolk.

(*Classified Advertisements continued on page* 458)

APPOINTMENTS VACANT (ctd.)

OLD ESTABLISHED firm require SALES REPRESENTATIVE. Preference will be given to one having established connection with Gas Dist. Engineers. State whether well known in any particular part of the country. Apply stating age and experience to No. 198, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

SCOTTISH GAS BOARD

GREENOCK, GOUROCK AND PORT GLASGOW DISTRICT WORKS SUPERINTENDENT

APPLICATIONS are invited from suitably qualified persons for the above position. The post is graded A.P.T. IX (£635-£735 per annum) with placing according to qualifications and experience.

Applicants should have good all round Gas Works experience including Vertical Retorts, Tully Complete Gasification Plant and must have ability to control and organise labour.

A house, if necessary, will be made available at a moderate rent.

Applications, stating age, qualifications and experience should be addressed to the undersigned to be received not later than ten days from date of publication of this advertisement.

WILLIAM KIRK,
District Manager.

Inchgreen Gas Works,
Greenock.
May 14, 1954.

WALES GAS BOARD

PONTYPOOL UNDERTAKING
TECHNICAL ASSISTANT/-
SENIOR RELIEF SHIFT SUPERINTENDENT

APPLICATIONS are invited from suitable young men between the ages of 20/25 to be trained for the above appointment.

Applicants should have had previous experience in the laboratory of a Gas Works, and/or be conversant with the control of Gas Works plant, or have a sound knowledge of chemical and/or mechanical engineering.

The commencing salary will be within Grade A.P.T. V with placing according to qualifications and experience.

The successful candidate will be required to pass a medical examination and if eligible to subscribe to the Board's Staff Pension Scheme.

Applications, stating age, education, qualifications, and experience, with the names of two referees, should be forwarded to A. Facer, General Manager, Wales Gas Board (Pontypool Undertaking), Gas Offices, Hanbury Road, Pontypool, Mon., not later than June 3, 1954.

EAST MIDLANDS GAS BOARD

NOTTINGHAM SUB-DIVISION
NOTTINGHAM UNDERTAKING
APPOINTMENT OF WORKS CHEMIST

APPLICATIONS are invited from suitably qualified persons for the position of WORKS CHEMIST for the Nottingham Undertaking at a commencing salary within A.P.T. Grade VIII (£605/£685) according to age, qualifications and experience.

Applicants should have a sound knowledge of the control of gas manufacture, and be experienced in the carrying out of all the usual gas works tests.

The successful candidate may be required to pass a medical examination, and unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, giving full details and the names of two referees, should be submitted to the undersigned not later than May 29, 1954.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
P.O. Box 62,
Friar Gate,
Derby.

EDUCATIONAL

THE UNIVERSITY OF LEEDS

POWER-GAS CORPORATION SCHOLARSHIP

APPLICATIONS are invited for the above Scholarship of the value of £150 a year, which has been provided to enable suitably qualified students to undertake a course of study leading to a degree in either Gas Engineering, Chemical Engineering, Mechanical Engineering or Civil Engineering in the University.

Preference will be given to candidates who reside within the Borough boundaries of Stockton-on-Tees or Thornaby-on-Tees, or who attended a Grammar or Secondary School in Stockton or Thornaby, or who are either employees or the children of employees of the Power-Gas Corporation Ltd. or of Messrs. Ashmore, Benson, Pease & Co. Ltd. Applicants should be under the age of 19 on October 1, 1954.

Applications should reach the Registrar, The University, Leeds 2, from whom further particulars and forms of application may be obtained, not later than June 30, 1954.

THE UNIVERSITY OF LEEDS

WILLIAM CARTWRIGHT HOLMES SCHOLARSHIP IN GAS ENGINEERING

APPLICATIONS are invited for the William Cartwright Holmes Scholarship in Gas Engineering, tenable in the Department of Coal Gas and Fuel Industries in the University. The present value of the Scholarship is £140 a year and it is tenable for one, two or three years, with power of extension for a fourth year.

The Scholarship is intended to enable a student to take a course of study in preparation for a responsible position in Gas Engineering.

Further particulars and forms of application may be obtained from the Registrar, The University, Leeds 2, to whom application should be made before June 30, 1954.

THE UNIVERSITY OF LEEDS

CORBET AND HENRY WOODALL SCHOLARSHIP IN GAS ENGINEERING

APPLICATIONS are invited for the Corbet and Henry Woodall Scholarship in Gas Engineering, tenable in the University, of the value of £135 a year. It is tenable for three years, with power of extension for a fourth year.

The Scholarship is intended to enable a student to take a course of study in Gas Engineering at the University in preparation for a responsible position as a gas engineer. Applicants must be qualified to enter upon a degree course.

Further particulars and forms of application may be obtained from the Registrar, The University, Leeds 2, to whom application should be made before June 30, 1954.

THE UNIVERSITY OF LEEDS

GAS PLANT MANUFACTURERS' DEVELOPMENT COUNCIL SCHOLARSHIP

APPLICATIONS are invited for the above Scholarship of a value of up to £215 a year; in special circumstances a higher award of up to £280 a year may be made. The Scholarship is provided to enable promising students to follow an Honours course in either Gas Engineering or Chemical Engineering as preliminary training for entry into the Gas Plant Industry.

The Scholarship is open to applicants of British Nationality from school or from industry; among the latter preference will be given to candidates already engaged in the Gas Plant Industry.

Applications should reach the Registrar, The University, Leeds 2, from whom further particulars and forms of application may be obtained, not later than June 30, 1954.

PLANT, &c. WANTED

WASTE MERCURY required: large or small quantities. Top prices: cash on collection London and Home Counties.—Belgrave Buyers (G.J.), 5, Belgrave Gardens, London, N.W.8. MAI. 7513.

AGENCY

AGENTS required for sale of Syphon Pots, Surface Boxes, etc.; good commissions. Apply: No. 197, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PUBLICATIONS

GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.

NATURAL BRITISH.

BOG (DUTCH and DANISH) ORE.

SPENT OXIDE.

LONDON ROAD, LEICESTER.

Telegrams: "BRIPURIMAT"
Telephone: 59086

STEREO AIDS EDUCATION

in that it is a more dynamic presentation than any other of following step by step the erection of complicated plant. District Gas Education Committees are urged to make further enquiries to

Walter King Photography,

11, Bolt Court, Fleet Street, E.C.4
CEN 2236

STRINGER BROTHERS

ALBION WEST BROMWICH

S.B
IRON & STEEL
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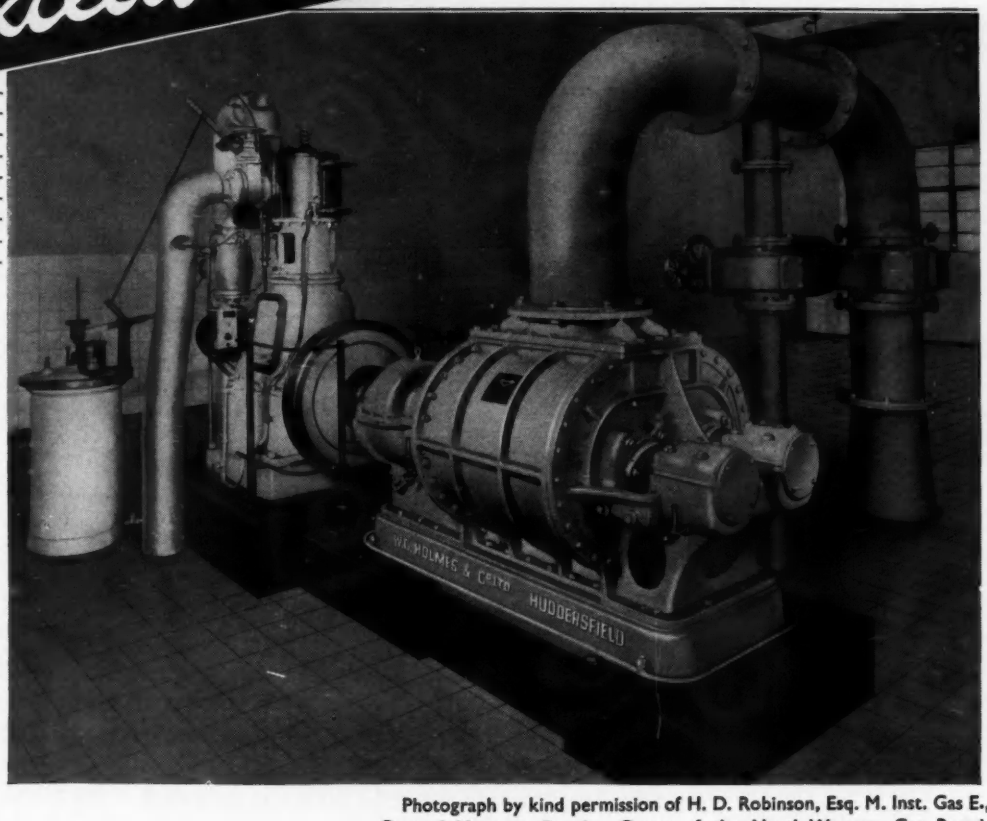

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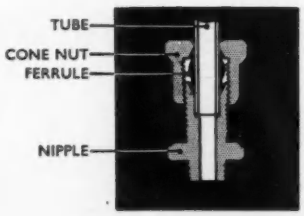
DIRECT COUPLED COMPRESSORS (see *illustration right*) *are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7½".*
CAPACITY RANGE: *100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.*

TYPE 4 COMPRESSORS (*not illustrated*) *are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.*
CAPACITY RANGE: *500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.*
AREA OCCUPIED: *from 9¼" x 16½" to 61" x 27".*

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. *Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.*



serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner *with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies.*
Size Range: *1", 1¼", 1½", 2" and 2½" outlets.*
Capacity Range: *45-280 cub. ft. of gas per hour.*

Brass non-blow-off head types: *deal with 5 to 10 cub. ft. of gas per hour.*

Stainless steel, "F" type head, burner: *deals with 8 cub. ft. of gas per hour.*

Perforated head type burner: *deals with 10 to 15 cub. ft. of gas per hour.*

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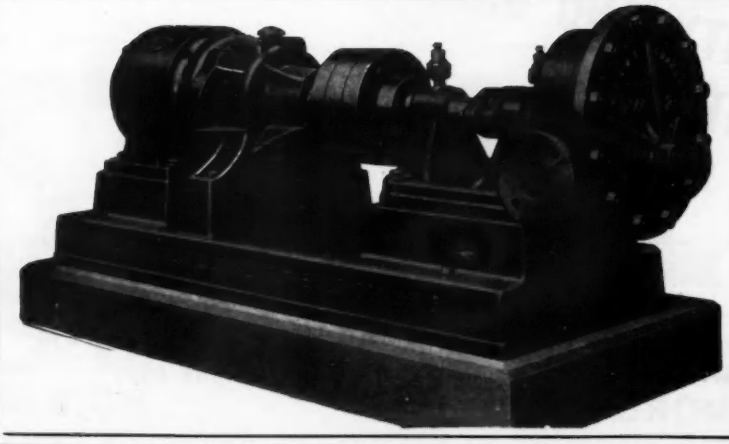

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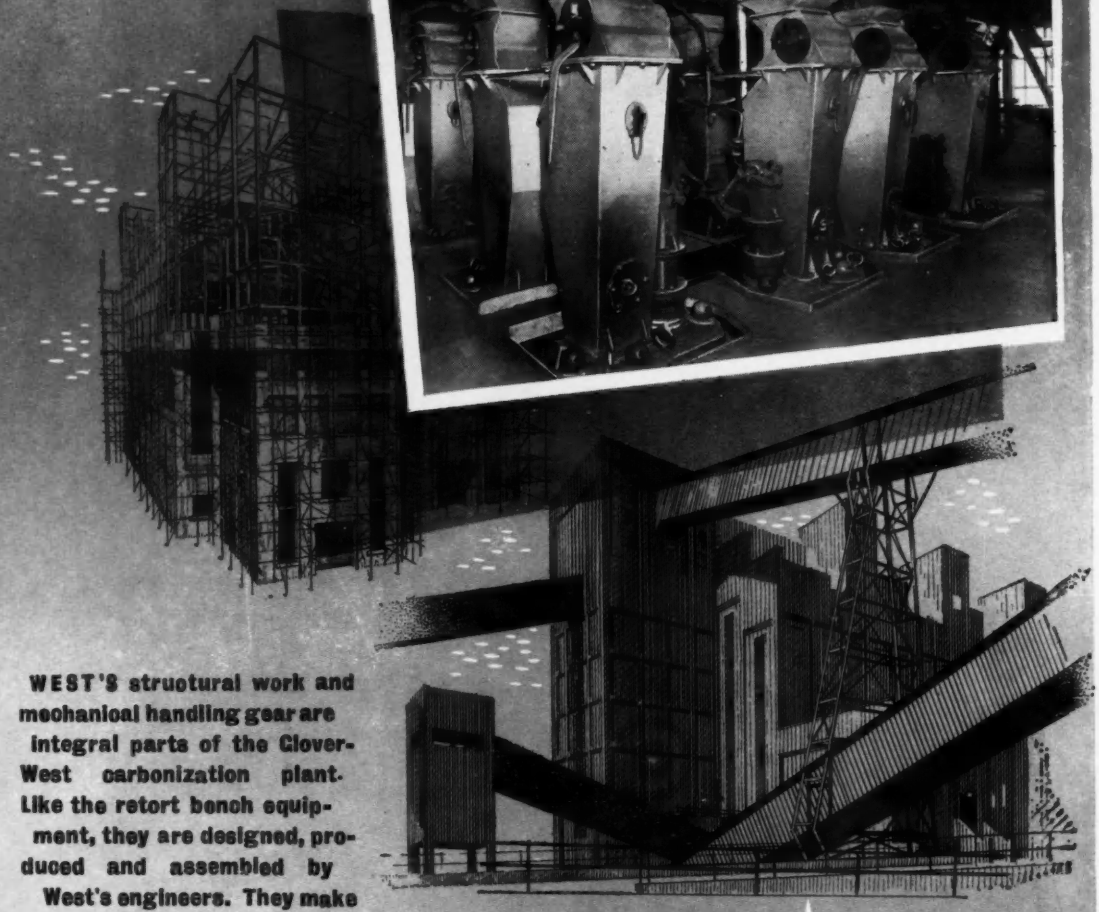
Behind the Retorts



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